REMEDIAL INVESTIGATION WORK PLAN

Operable Unit-2
Off-site – Subsurface / Groundwater

688-700 Court Street
Brooklyn, NY

NYSDEC Site
No. 224145

LANXESS Solutions US Inc.

Project No. 214132
March 2021

WOODARD &CURRAN

800 Westchester Avenue, Suite N507
Rye Brook, NY

woodardcurran.com
COMMITMENT & INTEGRITY DRIVE RESULTS

TABLE OF CONTENTS

TABLES

FIGURES

APPENDICES

1. INTRODUCTION

Woodard & Curran Engineering and Geological Services P.A.P.C. (Woodard & Curran) has prepared the following Operable Unit No. 2 (OU-2) Remedial Investigation Work Plan (RIWP) for the former LANXESS Solutions US Inc. (LANXESS)/Chemtura Corporation (Chemtura) facility[1] located at 688-700 Court Street (herein referred to as the "Site"), in Brooklyn, Kings County, New York (Figure 1). This RIWP was prepared in accordance with the New York State Department of Environmental Conservation (NYSDEC) Division of Environmental Remediation's Technical Guidance for Site Investigation and Remediation dated May 2010 (DER-10), the Amended Order on Consent D2-03811-10-08 dated November 30, 2010 between Chemtura and the NYSDEC (Consent Order), and the NYSDEC Letter dated August 24, 2020 (Appendix A) which establishes Operable Units (OUs) to address the investigation of potential off-site subsurface and groundwater contamination associated with past LANXESS/Chemtura operations at the Site. As specified in the August 24, 2020 NYSDEC Letter, the NYSDEC has determined that the remedial program at the Site will be managed by designating the following OUs:

- OU-1: On-site;
- OU-2: Off-site Subsurface/Groundwater; and
- OU-3: Off-site Aerial Deposition.

The investigation of OU-1 is currently underway and is being implemented in accordance with the NYSDEC approved Work Plan dated January 2018 and the subsequent May 29, 2018 Scope of Work letter. In addition, an OU-specific RIWP for OU-3 was submitted to NYSDEC on February 16, 2021; as of the date of this RIWP, approval of the OU-3 RIWP is pending.

On March 3, 2021, NYSDEC issued a letter requesting a RIWP for OU-2 (Appendix A). The March 3, 2021 letter included a list of contaminants developed based on the soil and groundwater data of the OU-1 RI and the findings of previous investigation that require further investigation as part of the OU-specific RIWP. It should be noted that the NYSDEC list of contaminants provided in the March 3, 2021 may not represent the final list of contaminants determined to be Site-related; however, for the purposes of this RIWP, LANXESS has agreed to investigate the list of contaminants included in the March 3, 2021 NYSDEC letter. The OU-2 RIWP presented herein includes the proposed sampling, analyses, reporting, and quality assurance/quality control (QA/QC) requirements for the investigation of OU-2, located to the north of the Site and within the southern portion of Red Hook Park. Note that the proposed scope is intended to supplement the existing body of data. LANXESS and Woodard & Curran will also rely on existing data collected during previous investigations by others, as well as data collected during the remedial investigation of OU-3 to help define the full nature and extent of contamination in OU-2 and identify contaminants of concern (COCs). The COCs for OU-2 have been identified by the NYSDEC in their letter dated March 3, 2021 (see Appendix A). LANXESS disagrees with the premise that the Constituents of Concern for OU-2 can be established prior to NYSDEC review and approval of the OU-1 Site-Specific Supplemental Remedial Investigation (SRI) Report. LANXESS's obligation under the Amended Order on Consent is to "address on-Site Contamination and off-Site Contamination caused by the past operations of

[1] On September 25, 2016, Chemtura entered into a merger agreement with LANXESS Deutschland GmbH, a limited liability company under the laws of Germany (LANXESS), and LANXESS Additives Inc., a Delaware corporation and an indirect, wholly-owned subsidiary of LANXESS ("Merger Subsidiary"). On April 21, 2017 (the "Closing Date"), the Merger Subsidiary merged with and into Chemtura, with Chemtura surviving the merger. As a result of this transaction, Chemtura was renamed "LANXESS Solutions US Inc." on or about the Closing Date. The legal entity formerly known as Chemtura Corporation continues after the Closing Date as a subsidiary of LANXESS.

[LANXESS]." As such, it is impossible to define off-site Constituents of Concern (i.e., constituents that merit remediation) until the SRI for OU-1 has been approved.

Nevertheless, in the spirit of compromise and recognizing the NYSDEC's desire for an expeditious investigation of OU-2, LANXESS is prepared to proceed with the next phase of OU-2 investigation as outlined in the second and fourth paragraphs of the NYSDEC March 3, 2021 letter. However, rather than referring to the constituents as COCs, which have not yet been established, COCs are referred to herein as Potential Constituents of Interest, or PCOIs.

While LANXESS is submitting this RIWP to investigate OU-2 in its entirety as requested by the NYSDEC, under the Consent Order, LANXESS is not required to remediate any contamination that was not caused by Chemtura's past operations, and by the submission of this RIWP, LANXESS is not committing to conduct any remediation at OU-2. LANXESS reserves the right to object to conducting any remediation at OU-2 pending the results of the investigation to be conducted under this RIWP.

1.1 Background

In April 2013, a Remedial Investigation Report (2013 RIR) was prepared by WSP Engineering of New York, P.C. (WSP) for the Site and submitted to the NYSDEC. The 2013 RIR was approved in correspondence from the NYSDEC on June 27, 2013. A draft Feasibility Study (FS) was prepared and submitted by Woodard & Curran on behalf of LANXESS in October 2014. Comment and response letters were exchanged between the NYSDEC and LANXESS in 2016 and 2017, in addition to a meeting conducted with NYSDEC and LANXESS representatives on July 7, 2016. A Supplemental Remedial Investigation (SRI) was proposed by LANXESS to address data gaps that were identified after NYSDEC approval of the 2013 RIR. In a March 10, 2017 letter (Appendix A), NYSDEC agreed that sufficient data gaps existed to warrant a supplemental remedial investigation, and approval of the 2013 RIR was rescinded based on the data gaps identified by LANXESS.

Following the March 10, 2017 letter, LANXESS submitted a SRI Work Plan (SRIWP) to the NYSDEC on May 8, 2017. NYSDEC provided comments in a letter to LANXESS dated September 19, 2017 (Appendix A). LANXESS and NYSDEC representatives met on November 15, 2017 to discuss the SRIWP and agreed that the initial phase of the SRI should focus on determining the nature and extent of on-site contamination, with subsequent off-site investigations to be conducted following concurrence on Site-related contaminants of concern. LANXESS incorporated the agreed upon components into a revised Site-Specific SRIWP dated January 2018. Implementation of the revised Site-Specific SRIWP (and modified based on a NYSDEC letter dated May 29, 2018), is currently underway and includes investigation of the nature and extent of subsurface contamination in Site soils and groundwater. Following issuance of the August 24, 2020 NYSDEC letter, on-site subsurface contamination, which was the focus of investigations proposed in the January 2018 Site-Specific SRIWP, is now designated as OU-1 (On-site).

1.2 Objective

The objective of this OU-2 RIWP is to conduct remedial investigation activities to address data gaps identified in the 2013 RIR, and to develop a RIR and FS for OU-2 (Off-site Subsurface/Groundwater). This OU-2 RIWP was prepared based on data from previous investigations conducted at the Site including, but not limited to, data included in the 2013 RIR, investigations conducted by Woodard & Curran in 2013 and 2014, the requirements identified in the NYSDEC's letters dated March 10, 2017 and September 19, 2017, the subsequent meeting on November 15, 2017 between NYSDEC and LANXESS, the associated December 5, 2017 Meeting Summary letter submitted by Woodard & Curran on behalf of LANXESS (Appendix A), the March 3, 2021 NYSDEC letter, and the preliminary findings of the SRI for OU-1, provided to the NYSDEC during the course of the investigation.

1.3 Certification

I, Nicholas Hastings, PG (#490), certify that I am currently a NYS Professional Geologist as defined in Section 7204-a of the NYS Education Law, and that this Work Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with DER-10.

2. SITE DESCRIPTION AND HISTORY

2.1 Site Description

2.1.1 Site Location

The Site is a 5.5-acre property located at the southwest corner of the intersection of Court Street and Halleck Street in the Red Hook section of Brooklyn, Kings County, New York (Figure 1). According to the New York City Automated City Register Information System (ACRIS), the Site is identified on the New York City Department of Finance Tax Map as Block 621, Lot 1 and Lot 34. The Site has been used for industrial/commercial purposes since approximately 1904 and is currently subdivided into several leaseholds. Impervious surfaces including asphalt, concrete and building footprints cover the majority of the Site.

2.1.2 Surrounding Property Use

As shown on Figure 2, the Site is bordered to the north by a closed section of Halleck Street and Red Hook Recreation Area (also referred to as Red Hook Park); to the south by Bryant Street and a Major Oil Storage Facility (MOSF No. 2-1520) previously occupied by Buckeye Partners, L.P. (Buckeye); to the west by Clinton Street and Sunshine Lighting and Warehousing; and to the east by Court Street and National Grid USA (and was formerly a Brooklyn Union Gas Company property). Based on New York City zoning maps, the Site and surrounding commercial properties are classified as manufacturing district, M3-1 – Heavy Manufacturing District (Low Performance). No new residential properties or community facilities are permitted in M3-1 districts.

The nearest residential zoned area is Halleck Street and Red Hook Recreational Park (Red Hook Park) located north of the Site. A line of mature oak trees borders the southern boundary of the park property to the north of the Site. Red Hook Park is the subject of multiple ongoing investigations and United States Environmental Protection Agency (U)SEPA-led removal actions associated with the Former Columbia Smelting and Refining Works Site. In addition, the southeastern portion of Red Hook Park is currently under investigation by Honeywell due to the presence of tar seeps potentially associated with 610-628 Smith Street, located to the east of the Site.

According to the NYC Department of City Planning GIS Zoning dataset, the nearest residential zoned area is Halleck Street, and the nearest residential structure is approximately 0.25-miles to the north of the Site (across Halleck Street towards Red Hook Park). The nearest residential structures to the east and south are located on the opposite side of the Gowanus Expressway, at distances of approximately 0.5-mile and 1-mile from the Site, respectively. The nearest residential structure to the west of the Site is located across the Upper New York Bay in Bayonne, New Jersey approximately 5.25 miles away.

2.1.3 Gowanus Canal Superfund Site

The Site is located approximately 200 feet northwest of the Gowanus Canal at the closest point (southern Court Street property boundary), a major industrial shipping route into the New York City metropolitan area and the location of the Gowanus Canal Superfund Site (a Comprehensive Environmental Response, Compensation, and Liability Act [CERCLA] Superfund investigation and remediation site). The early history of the Gowanus Canal (formerly known as the Gowanus Creek) and the Red Hook area of Brooklyn is well documented, as is the transformation of the Site and the surrounding areas from tidal marsh/wetlands into a commercial/industrial area, in the New York City Department of Environmental Protection (NYCDEP) August 2008 "Gowanus Canal, Waterbody/Watershed Facility Plan Report" (Gowanus Canal Plan). According to the Gowanus Canal Plan, the Gowanus Creek was a tidal creek, surrounded by large salt marshes as late as 1765 (NYCDEP 2008).

The tidal salt marshes extended at least up to Bay Street, indicating that the Site and adjacent surroundings were formerly under water. By 1840, dams, landfills, straightening and bulkheads had significantly changed the physical and ecological characteristics of the Gowanus Creek and its estuary. The areas along the creek and of the newly made land in the former estuary was mostly industrial, consisting of flour mills, cement works, tanneries, and factories producing paints, inks, and soaps. These industrial properties had an active history during which operations discharged

pollutants into the Gowanus Creek (NYCDEP 2008). The transformation from the Gowanus Creek to the Gowanus Canal took place between 1849 and 1869 (NYCDEP 2008). The Gowanus Canal Plan presents a series of figures that depict transformation by filling of the area that includes the Site that was completed in 1891.

It should be noted that the 688-700 Court Street Site is not part of the Gowanus Canal Superfund Site and the Consent Order expressly provides LANXESS "shall not be required to investigate or remediate any such contamination that has entered the Gowanus Canal or any areas that are being actively investigated or remediated as part of the investigation or remediation of the Gowanus Canal Superfund Site." Consent Order, § II.A.

2.2 Site and Regional Development History

Several historical resources were reviewed as part of the ongoing OU-1 investigation and in preparation for this RIWP, including Sanborn Fire Insurance Maps (Sanborns), historical aerial photographs, and historical photos. Copies of the relevant historical resources are provided in Appendix B. The relevant findings are discussed below.

Based on the Sanborn Fire Insurance Map from 1886, the 688-700 Court Street Site, and parcels to the south (the former Buckeye MOSF) and west (Sunshine Lighting) were designated as land under water, which suggests that the Site and surrounding area were filled prior to development. This is consistent with information presented in the GTI 1998 Phase I Environmental Site Assessment (ESA), which indicates that plant personnel interviewed during the preparation of the Phase I ESA stated that the plant was constructed atop fill material. A review of the Gowanus Canal Plan further confirms that the Site, and the surrounding area, including Red Hook Park to the north, were tidal marshes which were subject to filling during the 1800s. The source and composition of the material used to fill the "land under water" is unknown. Debris and other components of historic fill, including brick, glass, and/or other debris, were observed in Soccer Field 1 soils during the installation of groundwater monitoring wells as part of the 633 Court Street Site Characterization Investigation.

Sanborns from 1904 through 1950 indicate that the Site was comprised of and developed as two separate tax parcels (herein referred to as Block 621 and 622); Block 621 is comprised of the northern portion of the 688-700 Court Street Site, adjacent to Halleck Street, and Block 622 is comprised of the southern portion of the 688-700 Court Street Site.

Block 621 is undeveloped on the 1886, 1904, and 1915 Sanborns, and appears developed as of the 1939 Sanborn. At the time of the 1904 Sanborn, Block 622 is developed and operated by Milliken Brothers, a steel manufacturing facility which operated between pre-1904 until sometime prior to 1915. The Milliken Brothers facility included several buildings, a steam derrick, and a railroad spur (which was present along Percival street and the northern portion of Block 622). Note that Milliken Brothers operated several facilities in NYC that are subject to ongoing environmental investigations and remediation associated with former operations and historic filling. At the time of the 1977 Sanborn, Block 622 was incorporated into Block 621.

According to Sanborns, historic Percival Street, which is no longer present, bisected the 688-700 Court Street Site, with Block 621 to the north and Block 622 to the south. Percival Street appears on Sanborns from 1904, 1915, 1939, and 1950, and was present until before 1977. According to a 1958 Survey, Percival Street is present as an unimproved road. Aerial photographs from circa 1950 confirm the details of the 1958 Survey and the presence of Percival Street as unimproved, contemporaneously with the presence of buildings on Block 621.

In addition to the historic Percival Street, historic Sigourney Street, which bisects Red Hook Park into two parcels (Block 620, Block 619) is also depicted on the Sanborns from 1904, 1915, 1939, and 1950. Sigourney Street is not depicted on the Sanborn from 1977, suggesting that Sigourney Street was abandoned beneath Soccer Field 1 when Red Hook Park was developed sometime between 1950 and 1977. This is consistent with aerial photographs from circa 1950, which did not contain any evidence of Sigourney Street, but depicted Red Hook Park as developed with a natural turf soccer field. Aerial photographs further reveal that the natural turf field was present between circa 1950 until sometime between June 2002 and September 2002. Aerial photographic imagery from Google Earth indicates that between December 2001 and September of 2002, significant construction and earthworks took place within Soccer Field 1. By

August 2003 and until present time, Soccer Field 1 is constructed as a synthetic turf field. Note that LANXESS-related operations ceased in 1999, prior to the redevelopment of Soccer Field 1.

A review of historical photos of the Red Hook region of Brooklyn indicates significant historic fill, debris, and general refuse is prevalent in the vicinity of the Site and Red Hook Park (which was the site of a former shantytown). Historical photographs, which provide clear evidence of historic fill and debris in the immediate vicinity of the Site and Red Hook Park, are provided in Appendix B. As depicted in the historical photographs, drums, tanks, and other industrial and commercial construction and demolition debris are present within the current footprint of Red Hook Park and the surrounding areas. Berms of historic fill, estimated at a height of several feet above grade, can be observed on the northern and southern sides of Bay Street; these berms occupy the current footprint of Soccer Fields 1 and 6 within the Red Hook Park. No evidence of the proper removal and disposal of this material during the construction of Red Hook Park was available; it is likely that this material is still present beneath Red Hook Park.

2.3 Site Operational History

The Site has been in operation since sometime prior to 1904. At different times between 1904 and 1958, the property was used as a lumberyard, a marine canvas supply business, and an iron works facility. From 1958 until the mid-1960s, the Site was owned and operated by Argus Chemical Laboratory, which manufactured vinyl stabilizers and plastic additives. In the mid-1960s, Witco Corporation purchased Argus Chemical Laboratory and continued manufacturing plastic additives at the facility until 1999 when plant operations ceased. Subsequently, Witco Corporation merged with Crompton & Knowles and the merged company eventually became known as Crompton Corporation. Crompton Corporation later became known as Chemtura Corporation. Chemtura Corporation merged with LANXESS and became known as LANXESS Solutions US Inc.

Chemical processing ended in 1999 when Witco ceased plant operations (Wastewater Quality Control Application – November 2007). The Site was purchased by VIP Builders, LLC in November 2000. A subdivision application was submitted in 2013 and the property was sold to 688 Court LLC later that same year. A portion of the Site is currently occupied by VIP 2, LLC and is known as 757 Clinton Street. In accordance with NYSDEC correspondence dated May 12, 2016, the Site consists of two parcels; 1) Block 621 Lot 1 (known as 688-700 Court Street), and 2) Block 621 Lot 34 (known as 702 Court Street). This includes the portion of the Site occupied by VIP 2 (757 Clinton Street).

2.4 Current Site Use

The Site is currently surrounded by a masonry wall approximately ten feet in height. Similar masonry walls divide the 688-700 Court Street portion of the Site, owned by Pearl Realty, and the 757 Clinton Street portion of the Site, occupied by VIP Builders, LLC. Entrance to the Site is provided by several pedestrian doors, as well as several electric powered roll-up doors. The Site remains generally covered by impervious surfaces, primarily consisting of concrete and buildings.

The Site is occupied by the following tenants: Former Marriot Coach (bus repairs), Former Accord Bus (bus repairs), Rent-a-Unit (portable restroom maintenance and storage), MPD Design Build (woodworking and custom cabinetry), an Artist's Studio, Conido Basonas Construction (construction offices/storage), Al Mar Sheet Metal (sheet metal fabrication), a granite cutting/processing facility, Liberty Paper Supplies (a paper goods company), and several active and/or vacant warehouse spaces. Figure 3 presents a map of current known Site uses.

2.4.1 Site Topography and Geology

The Site is located on Long Island and falls within in the Atlantic Coast physiographic province of the United States. Long Island is bounded to the north by Long Island Sound, to the east and south by the Atlantic Ocean, and to the west by New York Bay and the East River. The land surrounding and including the Site was formed through historic filling of waterfront and marsh areas in the late 1800's to early 1900's. The Site is relatively flat and is improved with impervious

surfaces including asphalt pavement, concrete, and commercial buildings. Comparison of on-site and off-site ground surface elevation ranges from approximately 6 to 12 feet above mean sea level.

According to the GTI 1998 Phase I ESA, underlying this historic fill is a layer of alluvial/marsh deposits comprised of sands, peat, organic silts, and clays. These alluvial/marsh deposits are associated with the original wetlands complex that was present when the area was initially settled. Underlying the alluvial/marsh deposits is a thick layer of glacial deposits comprised of glacial sands, silts, and gravel that were deposited during the retreat of the last ice age. Underlying the sand/silt/gravel layer is a layer of dense clay. Both weathered and competent bedrock, comprised of Fordham Gneiss, underlies the glacial deposit layers.

2.4.2 Site Hydrogeology

Depth to groundwater ranges from approximately 2.5 to 7.5 feet below ground surface (bgs), with the elevation of groundwater generally ranging from approximately 2.2 to 5.5 feet above mean sea level. Based on previous assessments, groundwater generally flows radially from the center of the Site and to the north, with minor tidal influence due the proximity to the Gowanus Canal and Gowanus Bay.

2.4.3 Surface Water

There are no surface water bodies located on the Site. The closest surface water is the Gowanus Canal located approximately 200 feet to the southeast. Gowanus Canal is tidally influenced with maximum diurnal tidal fluctuation ranging between 4.2 and 4.3 feet along its full length (US EPA 2011). Gowanus Bay is located approximately 550 feet to the south of the Site, and the Henry Street Basin is located approximately 300 feet to the west of the Site. For the purposes of this report, the Gowanus Canal, Gowanus Bay, and Henry Street Basin are collectively considered the surrounding body of surface water.

3. SCOPE OF WORK

The proposed RIWP for OU-2 includes the following Scope of Work:

- Continued document review related to PCOIs associated with the past operations of LANXESS/Chemtura, its predecessors, and other potential contributors in the vicinity of the Site;
- Permitting and access coordination;
- Site clearing and preparation;
- Utility clearance and survey; and
- Vertical and horizontal delineation of subsurface soil and groundwater for PCOIs identified by the NYSDEC for OU-2 (see NYSDEC letter dated March 3, 2021 in Appendix A).

A discussion of each phase of the Scope of Work is presented below.

3.1 Document Review

Woodard & Curran proposes to continue conducting a review of available documents related to the construction, development, and operation of the Site, Red Hook Park, and the surrounding areas. The purpose of this review is to develop a detailed understanding of the Site operations associated with LANXESS/Chemtura, relative to the following: Site operations predating LANXESS/Chemtura and their predecessors, the construction of Red Hook Park, and the overall history and construction of the surrounding areas. This information will help evaluate the results of the OU-2 investigation and determine the potential sources of contamination in OU-2 and whether any can be attributed to past LANXESS/Chemtura operations.

3.2 Permitting and Access

In order to execute the proposed OU-2 RIWP Scope of Work, access and permission to conduct investigations in the vicinity of former Halleck Street and Red Hook Park will be required. Woodard & Curran anticipates requiring access and permits from the NYC Department of Transportation and the NYC Department of Parks and Recreation. Any schedule associated with the investigation of OU-2 is contingent on securing access and any necessary permits. Note that to the extent possible, permitting and access activities will be coordinated and conducted simultaneously with the execution of the OU-3 RI.

3.3 Site Clearing and Preparation

Based on observations from ongoing work associated with OU-1, a significant amount of overgrown vegetation, trash, and debris is present in the southern portion of OU-2 along former Halleck Street. This vegetation and trash/debris directly impedes the ability to safely conduct the proposed RI Scope of Work. Coordination with NYC Department of Transportation, who is presumably responsible for the management of former Halleck Street, and removal/clearing is required prior to initiating any OU-2 investigations. Any schedule associated with the investigation of OU-2 is contingent on securing a safe and obstruction free work area. Note that to the extent possible, clearing and preparation activities will be coordinated and conducted simultaneously with the execution of the OU-3 RIWP.

3.4 Utility Clearance and Survey

Prior to initiating any field activities, subsurface features and infrastructures will be located and marked-out to clear proposed drilling locations. Utility clearance will be conducted in two stages. Stage one will be conducted by public utility companies through the Dig Safely New York hotline to assess the Site area. Stage two will be conducted by a private utility locating company to clear proposed drilling locations. Following the completion of the OU-2 scope of work, soil boring and groundwater monitoring well locations will be surveyed by a New York State Professional Surveyor

to determine exact location and elevation. Note that to the extent possible, utility clearance and survey activities will be coordinated and conducted simultaneously with the execution of the OU-3 RI.

3.5 OU-2 (Off-site Subsurface/Groundwater) Remedial Investigation

3.5.1 OU-2 Subsurface Investigation

Following preparation and mobilization activities, Woodard & Curran will conduct a subsurface investigation to determine the full nature and extent of the PCOIs identified by the NYSDEC in OU-2. Note that the proposed boring and sample locations are meant to supplement the existing body of data; LANXESS and Woodard & Curran will also rely on existing data collected during previous investigations by others to help define the full nature and extent of Site-related contamination in OU-2.

As shown on Figure 5, a total of up to 37 borings will be advanced in OU-2 via direct-push and/or hollow-stem auger drill rig. In accordance with the NYSDEC letter dated March 3, 2021, all proposed soil borings will terminate at the top of the first aquitard (identified approximately 16-feet below grade in OU-1), unless data indicates deeper site-related contamination may be present. Soils will be characterized by a Woodard & Curran scientist/geologist and field-screened with a Photoionization Detector (PID) and visually/olfactory for presence and/or signs of contamination. Soil samples will be collected continuously in two-foot intervals from ground surface to the top of the observed aquitard/confining layer.

In accordance with the NYSDEC letter dated March 3, 2021, soil samples will be analyzed by an Environmental Laboratory Approval Program (ELAP) certified laboratory for the following contaminants: acetone, 2-butanone, benzene, toluene, ethylbenzene, xylenes (total), isopropylbenzene, tert-butylbenzene, n-propylbenzene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, naphthalene, phenol, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, 4,4'-dde, dieldrin, heptachlor, barium, cadmium, chromium, copper, nickel, lead, zinc, mercury, and total polychlorinated biphenyls (PCBS). If encountered, light non-aqueous phase liquid (LNAPL) and dense non-aqueous phase liquid (DNAPL) may be sampled and submitted to the laboratory for analysis of PCOIs.

The OU-2 subsurface investigation program, including the proposed number of borings, anticipated boring depths, and proposed laboratory analytical program, is outlined on Table 1. The proposed schedule for the implementation of the OU-2 subsurface investigation is presented on Table 2. QA/QC samples, including field equipment blanks and duplicates will also be collected for laboratory analysis, as shown on Table 3.

Note that the final number and location of soil samples may be adjusted based on field conditions/observations, access at the time of the investigation, results of the OU-3 RI (if applicable), and interim laboratory results. If necessary, additional "step-out" locations may be added to the OU-2 subsurface investigation based on the laboratory results and/or field observations; conversely, if existing or preliminary data suggests sufficient information is available to determine the full nature and extent of Site-related impacts in OU-2, LANXESS may reduce the proposed sampling program after consultation with the NYSDEC. In addition, LANXESS reserves the right to collect additional samples for forensic and/or specialty analysis to further determine nature and extent of PCOIs. LANXESS and Woodard & Curran will confer with the NYSDEC during the execution of the field investigation as appropriate.

3.5.2 OU-2 Groundwater Investigation

During the OU-2 Groundwater investigation, a minimum of six soil borings will be converted to shallow groundwater monitoring wells, as shown on Figure 5. The proposed well locations may be adjusted based on field observations. Monitoring wells will be constructed of 2-inch PVC with 10-slot screen and will straddle the observed water table to assess potential LNAPL conditions. Following installation, the OU-2 groundwater monitoring wells will be developed to establish communication with the surrounding aquifer.

The OU-2 groundwater monitoring wells (including any newly installed wells and existing wells MW-1 and MW-2) will be purged and sampled via USEPA low-flow sampling methodology and in accordance with NYSDEC DER-10 protocols. Water quality parameters including pH, temperature, dissolved oxygen, conductivity, turbidity and oxygen-reduction potential will be recorded during sampling. Following water quality parameter stabilization, a sample from each monitoring well will be collected for laboratory analysis.

In accordance with March 3, 2021 NYSDEC Letter, groundwater samples will be analyzed by an ELAP-certified laboratory for the following contaminants: acetone, 2-butanone, benzene, toluene, ethylbenzene, xylenes (total), isopropylbenzene, tert-butylbenzene, n-propylbenzene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, naphthalene, phenol, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, 4,4'dde, dieldrin, heptachlor, barium, cadmium, chromium, copper, nickel, lead, zinc, mercury, and total PCBs. If encountered, LNAPL/DNAPL will be sampled and submitted to the laboratory for analysis of PCOIs.

The OU-2 groundwater investigation sampling program, including the proposed sample depths, and proposed laboratory analytical program, is outlined on Table 1. The proposed schedule for the implementation of the OU-2 subsurface investigation is presented on Table 2. QA/QC samples, including field equipment blanks and duplicates will also be collected for laboratory analysis, as shown on Table 3.

Note that the final number and location of groundwater samples may be adjusted based on field conditions/observations, access at the time of the investigation, results of the OU-3 RI (if applicable), and interim laboratory results. If necessary, additional "step-out" locations may be added to the OU-2 groundwater investigation based on the laboratory results and/or field observations; conversely, if existing or preliminary data suggests sufficient information is available to determine the full nature and extent of Site-related impacts in OU-2, LANXESS may reduce the proposed sampling program after consultation with the NYSDEC. In addition, LANXESS reserves the right to collect additional samples for forensic and/or specialty analysis to further determine nature and extent of PCOIs. LANXESS and Woodard & Curran will confer with the NYSDEC during the execution of the field investigation as appropriate.

3.6 Waste Management

Investigation Derived Waste (IDW), including excess soil/drill cuttings and decontamination fluids will be collected and stored in 55-gallon drums, in a designated storage area pending the collection and analysis of waste characterization samples. Following waste characterization, IDW will be disposed in accordance with applicable local, state, and federal regulations at an off-site disposal facility permitted to accept the waste.

4. REPORTING AND SCHEDULE

4.1 Reporting

4.1.1 Periodic Reports

An account of field activities summarizing work performed, community air monitoring alarm data, and planned work for the following week will be provided to the NYSDEC (via email) on an ongoing basis. Field activities will also be summarized and included with the ongoing routine progress reports.

4.1.2 Remedial Investigation Report

Following completion of OU-2 field activities, all data will be evaluated and interpreted for the purposes of preparing the RIR. The RIR will be prepared in accordance with DER-10 and will provide a technical overview along with a description of the work completed under the NYSDEC-approved RIWP. The technical overview will include the following:

- A general profile of the investigation execution and results;
- The results and conclusions of the proposed document review (if FOIL information is received as requested) to be provided as a report appendix;
- Summary of any significant events, observations, or variations which may have influenced sampling procedures or analytical results;
- Results of all analyses, copies of relevant laboratory data sheets and the required laboratory data deliverables;
- Summary of the overall nature and extent of Site-related contamination and the Conceptual Site Model (CSM) using applicable SCOs and Response Action Outcomes (RAOs);
- Stratigraphic logs including soil physical descriptions, if applicable, and the following information:
  - Soil classification details;
  - Visual/olfactory observations;
  - Field instrument readings;
- Sampling Results Summary Table(s), including sample location, media, sample depth, and field and lab identification numbers;
- A summary table of analytical methods and quality assurance indicators;
- Analytical data validation results, including a Data Usability Summary Report (DUSR);
- Manifests to document the off-site transport of waste material;
- Site Figures including, but not limited to the following:
  - Site base maps; and
  - Sample location maps with surveyed or GPS-located sample points with sample information including sample depths and comparison to the applicable standards, criteria, and guidance (or other means of visually presenting the sample results).

Investigation data generated during implementation of the OU-2 RIWP will be submitted in the EQuIS electronic data deliverable format to the NYSDEC.

4.2 Schedule

A proposed schedule for the implementation of the OU-2 RIWP is provided on Table 2. Note that the proposed schedule is subject to change based on regulatory approvals and obtaining and coordinating any required access and local permits.

4.3 Health and Safety Plan

All OU-2 RI activities will be conducted in accordance with a Site-Specific Health and Safety Plan (HASP). A copy of the HASP has been provided in Appendix C. The HASP was developed in accordance with the requirements of the Occupational Safety and Health Administration (OSHA) HAZWOPER regulations (Standard 1910.123).

5. QUALITY ASSURANCE PROJECT PLAN

The purpose of this Quality Assurance Project Plan (QAPP) is to ensure that scientific data is acquired according to established methods and procedures designed to obtain results that are objective, true, repeatable and of known accuracy. Specifically, this QAPP provides guidance and specifications to ensure that activities associated with the proposed RI activities at the Site are planned and executed in a manner consistent with the quality assurance objectives stated below:

- Field determinations and analytical results are valid through adherence to NYSDEC field acquisition procedures, NYSDEC-approved analytical protocol, calibration and preventative maintenance of equipment;
- Samples are identified and controlled through chain-of-custody procedures;
- Records are retained as documentary evidence of field activities and observations;
- Generated data are validated in accordance with respective NYSDEC data validation guidelines; and
- Evaluations of the data are accurate, appropriate, and consistent throughout the project.

The content of this QAPP is based on the NYSDEC requirements as stated in NYSDEC DER-10. This QAPP includes:

- Data Quality Objectives and Project Scope;
- Project Organization and Responsibility;
- Sample Collection and Field Data Acquisition Procedures;
- Sample Analysis and Laboratory Data Deliverable Format;
- Sample Quality Assurance; and
- Quality Control Procedures.

5.1 Data Quality Objectives and Project Scope

The overall objective of the OU-2 RIWP is to determine the nature and the extent of contamination in OU-2 associated with the 688-700 Court Street Site. The proposed Data Quality Objectives (DQO) are as follows:

- DQO1 – Determine through laboratory analysis the horizontal and vertical nature and extent of subsurface soil and groundwater contamination in OU-2 for PCOIs.

5.2 Project Organization

The principal personnel for the project are identified below. The environmental consultant and New York-certified analytical laboratory are also listed below. Resumes for the referenced personnel are provided in Appendix F.

Environmental Consultant – Woodard & Curran Engineering and Geological Services P.A.P.C.

Mr. Michael van der Heijden, LSRP is Woodard & Curran's Project Director. As the Project Director, Mr. van der Heijden will provide oversight and ensure resources are available to complete the proposed SRI Scope of Work.

Mr. Nicholas Hastings, PG (#490) is Woodard & Curran's Technical Director. As the Technical Director, Mr. Hastings will provide technical oversight as necessary to complete the proposed RI Scope of Work and review project deliverables. Mr. Hastings will also serve as Woodard & Curran's Project Quality Assurance Officer and will be responsible for providing technical review of data and analytical results.

Woodard & Curran's contact information is provided below:

Woodard & Curran
800 Westchester Avenue, Suite N507
Phone: 914.448.2266
Fax: 914.448.0174
mvanderheijden@woodardcurran.com
nhastings@woodardcurran.com

Analytical Laboratory –The analytical laboratory will be Alpha Analytical Laboratories Westborough Massachusetts, a NYSDEC-certified laboratory.

Independent Data Validation Contractor - The data validation contractor will be Laboratory Data Consultants, Inc., of Carlsbad, California.

5.3 Sample Acquisition and Field Data Collection Procedures

Sampling will be conducted in accordance with established NYSDEC and USEPA protocols. Soil samples will be collected via dedicated acetate sleeves, and stainless-steel direct-push and/or hollow-stem auger.

5.4 Decontamination Procedures

Drilling and other sampling equipment will be decontaminated prior to collecting the first sample, between samples, and after the final sample. Prior to decontamination, a decontamination line will be set up on polyethylene sheeting. The decontamination line will progress from "dirty" to "clean", with an area for drying decontaminated equipment. Once the decontamination line is established, the following decontamination procedures will be implemented:

- Flush and rinse the equipment with potable water;
- Wash the item thoroughly in a bucket of soapy water (tap water) and use a stiff-bristle brush to dislodge any clinging dirt;
- Rinse the item in a bucket containing clear tap water and replace water as needed;
- Flush and rinse with distilled or deionized water;
- Flush and rinse with solvent and allow to air dry;
- Containerized decontamination fluids and stage on polyethylene sheeting pending subsequent collection and analysis of waste characterization samples; and
- Document that decontamination was performed in the appropriate logbook or sample sheet.

5.5 Wastes

Wastes, including residual solids and liquids, will be managed in accordance with Section 3.6.

5.6 Field Data and Notes

Field notebooks contain the documentary evidence for procedures as performed by field personnel. Hard cover, bound field notebooks will be used because of their compact size, durability and secure page binding. The pages of the notebook will be numbered consecutively and will not be removed.

Entries will be made in waterproof, indelible ink. No erasures will be allowed. If an incorrect entry is made, the information will be crossed out with a single strike mark and the change initialed and dated by the team member making the change.

Each entry will be dated. Entries will be legible and contain accurate and complete documentation of the individual or sampling team's activities or observations made. The level of detail will be sufficient to explain and reconstruct the activity conducted. Each entry will be signed by the person(s) making the entry.

The following types of information will be provided for each sampling task, as appropriate:

- Project name and number;
- Reasons for being on-site or taking the sample;
- Date and time of activity;
- Sample identification number;
- Geographical location of the sampling point with reference to Site (or other) facilities or a map coordinate system. Sketches will be made in the field logbook when appropriate;
- Physical location of the sampling point, such as depth below ground surface;
- Description of the method of sampling including procedures followed, equipment used, and any departure from the specified procedures;
- Description of the sample such as physical characteristics, odor, etc.;
- Results of field measurements such as organic vapors, etc.;
- Readings obtained from health and safety equipment;
- Weather conditions at the time of sampling and previous meteorological events that may affect the representative nature of a sample;
- Photographic information including a brief description of what was photographed, the date and time and the compass direction of the picture;
- Reference numbers from all serialized forms on which the sample is listed or labels which are attached to the sample (i.e., chain-of-custody forms, air bill numbers, etc.);
- Other pertinent observations such as the presence of other persons on the Site (those associated with the job, tenant personnel, other contractors), actions by others that may affect performance of Site tasks, etc.; and
- Names of sampling personnel and signature of persons making entries.

5.7 Field Instrument Calibration and Maintenance

On-site field calibration activities will include the use of calibration standards and field equipment checks, as appropriate, for the equipment being used, including, but not limited to a PID and water quality meter. Field calibration and/or checking of each instrument will be accomplished by following the procedures outlined in the operating manual for the equipment. At a minimum, field calibration will occur daily, prior to the initiation of sampling activities. Field calibration will be documented in the field notebook.

Equipment that fails calibration or becomes inoperable during use will be removed from service and segregated to prevent inadvertent use. The equipment will be properly tagged to indicate that it is out of calibration. Such equipment will be repaired and recalibrated to approved standards by qualified personnel. Equipment that cannot be repaired will be replaced.

Results of activities performed using field equipment that has failed recalibration will be evaluated by the Project Manager or designee. If the activity results are adversely affected, the results of the evaluation will be documented, appropriate personnel notified, and a decision made of the validity of the results.

Off-site calibration and maintenance of field instruments will be conducted as appropriate throughout the duration of project activities. All field instrumentation, sampling equipment and accessories will be maintained in accordance with the manufacturer's recommendations and specifications and established field equipment practice. Off-site calibration and maintenance will be performed by qualified personnel.

5.8 Sample Analysis and Laboratory Deliverable Format

Samples collected during implementation of the RIWP will be analyzed by a laboratory certified under the New York State Department of Health's ELAP and approved for solid and hazardous waste. The analytical data measurements will be of sufficient sensitivity to accurately quantify the laboratory results to concentrations at, or below, the NYSDEC Part 375 SCOs. The analytical methods and laboratory containers are summarized in Table 3 and Table 4, respectively.

Laboratory analytical data will be reported in ASP Category B data deliverables. Following analysis, the laboratory data will be reviewed by an independent data validation contractor to develop a DUSR. In addition, electronic data deliverables (EDDs) for results from samples of environmental media will be submitted in EQuIS™ format utilizing the NYSDEC Environmental Information Management System (EIMS).

5.9 Sample Quality Assurance

5.9.1 Sampling Program

Analytical methods and quality assurance parameters associated with the sampling program are presented in Table 3 and Table 4. Table 3 provides a summary of analyses to be conducted as part of the OU-2 RIWP. Table 4 provides details by parameter on the container volume and type, sample preservation and holding times for the sampling program. The frequency of associated field blanks and duplicates will be in accordance with NYSDEC protocols.

5.9.2 Sample Labeling

Each sample collected will be assigned a unique identification number and placed in an appropriate sample container. Each sample container will have a sample label affixed to the outside with the date, time of sample collection and project name. In addition, this label will contain the sample identification number, analysis required and chemical preservatives, if any.

5.9.3 Sample Handling

The analytical laboratory will provide pre-cleaned and prepared sample containers to collect samples for all matrices. The laboratory will also prepare and supply the required field blank sample containers, reagent preservatives, and trip blank sample containers according to the media to be sampled. Sample bottle containers, including the field blank and trip blank sample containers will be placed into coolers to be sent to the field sampling team.

Samples collected in the field for laboratory analysis will be placed directly into the laboratory-supplied sample containers. Individual sample containers will be sealed by hand-tightening container lids.

Possession of samples collected in the field will be traceable from the time of collection until they are analyzed by the analytical laboratory or disposed. To maintain and document sample possession, chain-of-custody procedures as described in Section 5.9.6 will be followed. Samples will be packaged and shipped as described in Section 5.9.7.

5.9.4 Sample Preservation

Sample preservation measures will be used to mitigate sample decomposition by contamination, degradation, biological transformation, chemical interactions, and other factors during the time between sample collection and analysis. Steps taken to maintain in-situ characteristics may include refrigeration of samples at approximately 4 degrees Celsius (ºC), freezing, pH adjustment, and/or chemical fixation. Samples are preserved according to the requirements of the specific analytical method selected.

The analytical laboratory will add the required preservatives to the appropriate sample containers during preparation of the containers. The sample preservation method for each sample media is provided in Table 4.

5.9.5 Sample Blanks and Duplicates

Field blanks will be collected for soil and groundwater samples and will be obtained by pouring laboratory-supplied water through one of the decontaminated sampling devices and/or dedicated sampling equipment to be used for sample collection that day. As the laboratory water passes over the sampling device, it will be collected in the appropriate container for analysis. A trip blank will accompany all samples during transport to and from the Site to be analyzed for volatile organic compounds (VOCs). In addition, duplicate samples will also be collected and analyzed for quality assurance purposes (Table 3).

5.9.6 Chain-of-Custody Procedures

A program has been established for sample chain-of-custody that will be followed during sample handling activities in both field and laboratory operations. The primary purpose of chain-of-custody procedures is to document the possession of the samples from collection through shipping, storage and analysis to data reporting and disposal.

Chain-of-custody refers to the actual possession of the samples. Samples are considered to be in custody if they are within sight of the individual responsible for their security or locked in a secure location by that person. Each person who takes possession of the samples, except the shipping courier, is responsible for sample integrity and safekeeping.

Chain-of-custody procedures are provided below:

- Chain-of-custody will be initiated by the laboratory supplying the pre-cleaned and prepared sample containers. Chain-of-custody forms will accompany the sample containers;
- At the time of sample collection, the chain-of-custody form will be completed for the sample collected. The sample identification number, date and time of sample collection, analysis requested and other pertinent information (e.g., preservatives) will be recorded on the form. All entries will be made in waterproof, indelible blue or black ink;
    - Field samplers will be responsible for the care and custody of the samples collected until the samples are transferred to another party, dispatched to the laboratory, or disposed. The sampling team leader will be responsible for enforcing chain-of-custody procedures during field work;
    - When the form is full or when all samples have been collected that will fit in a single cooler, the sampling team leader will check the form for possible errors and sign the chain-of-custody form. Any necessary corrections will be made to the record with a single strike mark, dated, and initialed; and
    - A copy of the chain-of-custody form will be retained by the sampling team for the project file and the original will be sent with the samples.

When transferring custody of the samples, the individuals relinquishing and receiving custody of the samples will verify sample numbers and condition and will document the sample acquisition and transfer by signing and dating the chain-

of-custody form. This process documents sample custody transfers from the sampler, usually through an express courier, to the analyst in the analytical laboratory.

Laboratory chain-of-custody will be maintained throughout the analytical processes as described in the laboratory's Quality Assurance Manual. The analytical laboratory will return the original chain-of-custody in the analytical data deliverable package. The chain-of-custody form becomes the permanent record of sample handling and shipment.

5.9.7 Sample Shipment

Although it is not anticipated, samples requiring shipment will be packaged and shipped as environmental samples in accordance with applicable federal and state regulations. Special declarations of type of samples and media will be made on the shipping label.

5.9.8 Packaging

Sample containers, and associated blanks will be packed in coolers with appropriate packaging material to minimize breakage and packed with ice in plastic bags and/or ice packs to maintain a temperature of approximately 4ºC during transit. Paperwork will be put in a plastic bag and placed on top of the sample containers/ice or taped to the inside lid of the cooler. The cooler will be taped closed. Laboratory address labels will be placed on top of the cooler, and the cooler will be placed in transit to be received at the laboratory within 24 hours of shipment from the field.

5.9.9 Shipping

Standard procedures to be followed for shipping environmental samples to the analytical laboratory are outlined below.

- All environmental samples collected will be transported to the laboratory by field personnel, by laboratory personnel, by courier, or shipped by overnight service;
- Daily shipments will be sent whenever necessary to meet holding time requirements; and
- The laboratory will be notified to be prepared to receive a shipment of samples. If the number, type, or date of shipment changes due to Site constraints or program changes, the laboratory will be informed.

5.9.10 Sample Storage

Once samples are transported to the laboratory, custodial responsibility of the samples is transferred to the Laboratory Sample Manager to assure that the appropriate procedures and methods are followed. Sample storage procedures will be in accordance with the laboratory's Quality Assurance Manual.

5.10 Quality Control Procedures

Sample quality control consists of those activities specifically conducted to ensure that the quality assurance program described in this QAPP is being implemented according to the specified requirements, to assess the effectiveness of the sample quality assurance program, to identify non-conformances, and to verify that any identified deficiencies are corrected. If any significant deviations from the quality assurance program are documented, corrective measure(s) will be immediately implemented and documented. Sample quality control will consist of data and technical review as described below.

5.10.1 Data Review

The laboratory analytical data will be reviewed by a third-party independent data validation contractor (Laboratory Data Consultants, Inc., of Carlsbad, California) in general accordance with the NYSDEC DUSR guidelines and USEPA Contract Laboratory Program National Functional Data Validation Standard Operating Procedures for Data Evaluation and Validation. Data validation criteria that will be reviewed for representative samples will include: sampling and

analysis date, sample custody, holding times, sample handling and preservation procedures, field blank results, field and laboratory duplicate sample results, surrogate recoveries, matrix spike/matrix spike duplicate results, laboratory control standards, laboratory method blanks, lot assignment reports and miscellaneous observations. Based on these results, data that do not meet performance criteria will be flagged with qualifiers describing the data's usability.

The required precision and accuracy from the analytical method will be applied. Where no guidelines or criteria exist, analytical documentation, report results versus raw data and quantitative calculations will be verified, and professional judgment will be applied in reviewing the data.

A summary of the sample program is provided in Table 3.

5.10.2 Technical Review

The reduction and analysis of data obtained through the sampling program along with the conclusions/recommendations reached based on these data will be reviewed to ensure the quality of the data and the validity of the conclusions/recommendations.

To ensure accurate transfer of laboratory data, the accuracy of electronic copies of analytical data provided by the laboratory will be verified by manually checking a minimum of ten percent of the sample data of the hard copy laboratory data package(s). Similarly, data that are reduced into tables and/or electronically reformatted to facilitate data evaluation (e.g., data summary tables highlighting exceedances of cleanup standards) will be verified by manually checking a minimum of ten percent of the sample data. If inaccuracies are detected, additional data will be checked, and appropriate corrective actions will be taken.

Conclusions and/or recommendations will be reviewed by one or more peers of the professional who develops the conclusion/recommendation to ensure their accuracy on the basis of the data that have been acquired and the analyses that have been conducted. Technical reviews will be performed by professionals who have the necessary knowledge and skill to perform the review.

6. COMMUNITY AIR MONITORING PLAN

6.1 Monitoring Controls

Real-time air monitoring for particulate levels and/or VOCs at the perimeter of the exclusion zone or work area will be necessary when conducting the OU-2 RIWP. VOC and particulate monitoring will be done with a PID and a Dust Monitor, respectively.

6.2 Continuous Monitoring

Continuous monitoring for dust and VOCs will be required for all ground intrusive activities. Ground intrusive activities for this project primarily include soil boring advancement and soil sampling.

6.3 Periodic Monitoring

Periodic monitoring for VOCs will be completed during non-intrusive activities such as the collection of soil and/or the gauging of monitoring wells. "Periodic" monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be completed during sampling activities.

6.4 VOC Monitoring, Response Levels and Actions

VOCs will be monitored at the downwind perimeter of the immediate work area (the exclusion zone) on a continuous basis. Upwind concentrations will be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work will be performed with a PID. The equipment will be calibrated daily and will be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities will be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.
2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities will be halted, the source of vapors identified, corrective actions taken to abate emissions and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.
3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities will be shut down and a re-evaluation of activities and mitigation measures will be initiated.
4. All 15-minute readings will be recorded and be available for State (NYSDEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes will also be recorded in field notes.

6.5 Particulate Monitoring, Response Levels, and Actions

Particulate concentrations will be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring will be performed using real-time monitoring equipment capable of measuring particulate matter (PM) less than 10 microns (µm) in size (PM10) and will be capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment

will be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration will be visually assessed during all work activities. Readings will be compared to the levels specified below.

1. If the downwind PM10 particulate level is 100 micrograms per cubic meter (µg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques will be employed. Work may continue with dust suppression techniques provided that downwind PM10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.
2. If, after implementation of dust suppression techniques, downwind PM10 particulate levels are greater than 150 µg/m^3 above the upwind level, work will be stopped, and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM10 particulate concentration to within 150 µg/m^3 of the upwind level and in preventing visible dust migration.
3. All readings will be recorded and be available for State (NYSDEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes will also be recorded in field notes.

7. REFERENCES

USEPA Brooklyn-Queens Aquifer System, Support Document, Kings and Queens Counties, New York, United States Environmental Protection Agency, December 1933

DER-10 DER-10/Technical Guidance for Site Investigation and Remediation, New York State Department of Environmental Conservation, DEC Program Policy, May 3, 2010

GTI 1998 Phase I Environmental Site Assessment, Brooklyn Plant, Brooklyn, New York, Fluor Daniel, GTI March 1998

ESI 1999 Results of Phase II Site Investigation, Witco Brooklyn Plant, Court Street, Brooklyn, New York, Enviro-Sciences, Inc. May 1999

ESC 2002 Draft Pilot Test Summary Report for Dual-Phase Extraction and Dual-Phase Extraction with Steam Injection, ESC Engineering of New York, P.C., 2002

NYCDEP 2008 Gowanus Canal Waterbody/Watershed Facility Plan Report, the City of New York, Department of Environmental Protection, August 2008

USEPA 2011 Gowanus Canal Remedial Investigation Report, Volume 1, Unites States Environmental Protection Agency, HDR/CH2MHill/GRB Environmental Services, Inc., January 2011

WSP 2013 Remedial Investigation Report, Chemtura Corporation, 688-700 Court Street, Brooklyn, New York, WSP Engineering of New York, P.C., 4/26/2013

Woodard & Curran 2014a Final Interim Remedial Investigation Progress Report – Water Level Study, Chemtura Corporation, 633 Court Street, Brooklyn, New York, Woodard & Curran, September 18, 2014

Woodard & Curran 2014b Draft Feasibility Study, 688-700 Court Street, Brooklyn, New York. Woodard & Curran P.A.P.C., October 2014.

Woodard & Curran 2016 Vapor Intrusion Investigation Report, 688-700 Court Street, Brooklyn, New York. Woodard & Curran P.A.P.C., January 2016.

NYSDEC 2017 Letter from the New York State Department of Environmental Conservation to Chemtura Corporation, March 10, 2017 (Appendix A).

NYSDEC 2017 Letter from the New York State Department of Environmental Conservation to LANXESS Solutions US Inc., September 19, 2017 (Appendix A).

NYSDEC 2018 Letter from the New York State Department of Environmental Conservation to LANXESS Solutions US Inc., May 29, 2018 (Appendix A).

NYSDEC 2020 Letter from the New York State Department of Environmental Conservation to LANXESS Solutions US Inc., August 24, 2020 (Appendix A).

NYSDEC 2020 Letter from the New York State Department of Environmental Conservation to LANXESS Solutions US Inc., December 18, 2020 (Appendix A)

LANXESS 2021 Letter from LANXESS Solutions US Inc. to the New York State Department of Environmental Conservation, January 15, 2021 (Appendix A)

NYSDEC 2021 Letter from the New York State Department of Environmental Conservation to LANXESS Solutions US Inc., January 28, 2021 (Appendix A)

NYSDEC 2021 Letter from the New York State Department of Environmental Conservation to LANXESS Solutions US Inc., March 3, 2021 (Appendix A)

TABLES

Table 1
Summary of Proposed Operable Unit No. 2 (OU-2)
Remedial Investigation Samples
688-700 Court Street, Brooklyn NY

Proposed Sample ID	Sample Intervals (feet bgs)***									Sample Type	Volatile Organic Compounds*	Semi-Volatile Organic Compounds*	Pesticides*	Inorganics*	Polychlorinated Biphenyls (PCBs)
	0-2'	2-4'	4-6'	6-8'	8-10'	10-12'	12-14'	14-16'	16'+*						
OU-2-SB-01	X	X	X	X	X	X	X	X	X	Soil	X	X	X	X	X
OU-2-SB-02	X	X	X	X	X	X	X	X	X	Soil	X	X	X	X	X
OU-2-SB-03	X	X	X	X	X	X	X	X	X	Soil	X	X	X	X	X
OU-2-SB-04	X	X	X	X	X	X	X	X	X	Soil	X	X	X	X	X
OU-2-SB-05	X	X	X	X	X	X	X	X	X	Soil	X	X	X	X	X
OU-2-SB-06	X	X	X	X	X	X	X	X	X	Soil	X	X	X	X	X
OU-2-SB-07	X	X	X	X	X	X	X	X	X	Soil	X	X	X	X	X
OU-2-SB-08	X	X	X	X	X	X	X	X	X	Soil	X	X	X	X	X
OU-2-SB-09	X	X	X	X	X	X	X	X	X	Soil	X	X	X	X	X
OU-2-SB-10	X	X	X	X	X	X	X	X	X	Soil	X	X	X	X	X
OU-2-SB-11	X	X	X	X	X	X	X	X	X	Soil	X	X	X	X	X
OU-2-SB-12	X	X	X	X	X	X	X	X	X	Soil	X	X	X	X	X
OU-2-SB-13	X	X	X	X	X	X	X	X	X	Soil					X
OU-2-SB-14	X	X	X	X	X	X	X	X	X	Soil	X	X	X	X	X
OU-2-SB-15	X	X	X	X	X	X	X	X	X	Soil					X
OU-2-SB-16	X	X	X	X	X	X	X	X	X	Soil	X	X	X	X	X
OU-2-SB-17	X	X	X	X	X	X	X	X	X	Soil	X	X	X	X	X
OU-2-SB-18	X	X	X	X	X	X	X	X	X	Soil	X	X	X	X	X
OU-2-SB-19	X	X	X	X	X	X	X	X	X	Soil	X	X	X	X	X
OU-2-SB-20	X	X	X	X	X	X	X	X	X	Soil					X
OU-2-SB-21	X	X	X	X	X	X	X	X	X	Soil					X
OU-2-SB-22	X	X	X	X	X	X	X	X	X	Soil					X
OU-2-SB-23	X	X	X	X	X	X	X	X	X	Soil					X
OU-2-SB-24	X	X	X	X	X	X	X	X	X	Soil	X	X	X	X	X
OU-2-SB-25	X	X	X	X	X	X	X	X	X	Soil	X	X	X	X	X
OU-2-SB-26	X	X	X	X	X	X	X	X	X	Soil					X
OU-2-SB-27	X	X	X	X	X	X	X	X	X	Soil	X	X	X	X	X
OU-2-SB-28	X	X	X	X	X	X	X	X	X	Soil					X
OU-2-SB-29	X	X	X	X	X	X	X	X	X	Soil	X	X	X	X	X
OU-2-SB-30	X	X	X	X	X	X	X	X	X	Soil	X	X	X	X	X
OU-2-SB-31	X	X	X	X	X	X	X	X	X	Soil	X	X	X	X	X
OU-2-SB-32	X	X	X	X	X	X	X	X	X	Soil					X
OU-2-SB-33	X	X	X	X	X	X	X	X	X	Soil					X
OU-2-SB-34	X	X	X	X	X	X	X	X	X	Soil	X	X	X	X	X
OU-2-SB-35	X	X	X	X	X	X	X	X	X	Soil	X	X	X	X	X
OU-2-SB-36	X	X	X	X	X	X	X	X	X	Soil	X	X	X	X	X
OU-2-SB-37	X	X	X	X	X	X	X	X	X	Soil	X	X	X	X	X
WC-MW-15										Ground Water	X	X	X	X	X
WC-MW-16										Ground Water	X	X	X	X	X
WC-MW-17										Ground Water	X	X	X	X	X
WC-MW-18										Ground Water	X	X	X	X	X
WC-MW-19										Ground Water	X	X	X	X	X
WC-MW-20										Ground Water	X	X	X	X	X
MW-01										Ground Water	X	X	X	X	X
MW-02										Ground Water	X	X	X	X	X

Note:

+* Based on anticipated depth of confining layer; final depth may extend below 16'

*Refer to Section 3.5 of the OU-2 Remedial Investigation Work Plan for listed PCOIs

**May include additional forensic analysis

' - Feet

N/A = Not Applicable

***-Soil depths to be determined based on field observations at time of site investigation

Table 2
Proposed Schedule for Implementation of
Operable Unit No. 2 (OU-2) Remedial Investigation
688-700 Court Street, Brooklyn NY

Task	Milestone	Duration [1]	Approximate No. of Weeks following NYSDEC Approval of the Operable Unit 2 Remedial Investigation Work Plan
			1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
RIWP Submission	Wednesday, March 24, 2021	1 Day	
NYSDEC Approval of RIWP	30 Days following Submission	30 Days	
Permitting and Site Access	Initiate within one week of Work Plan approval	Eight Weeks	
Premobilization Activities (Contractor and Equipment Procurement)	Initiate within one week of obtaining permits and access approvals	Two Weeks	
Utility Clearance and Site Preparation	Initiate within one week of obtaining permits and	One Week	
Soil Investigation and Well Installation	Initiate immediately following utiliy clearance and Site	Four Weeks	
Grounwater Monitoring Well Equilibration	Immediately following installation	Two Weeks	
Ground Water Sampling	Two weeks after well installation	One Week	
Laboratory Analysis	Intial Results within two weeks	Three Weeks	
Internal Data Review and Third Party Data Validation	Within one week of reciept of laboratory report	Eight Weeks	
Prepare and Submit Remedial Investigation Report	Initiate reporting upon receipt of final laboratory results	Ten Weeks	

Notes:

(1) Durations are estimated and may be adjusted due to field, weather, or other conditions beyond reasonable control.

Critical path item

Table 3
Summary of Analytical Parameters and QA/QC Samples
Operable Unit No. 2 (OU-2) Remedial Investigation
688-700 Court Street, Brooklyn NY

Soil						
Analyte	**Method**	**Minimum Reporting Limits**	**Soil**	**MS/MSD****	**Duplicate****	**Field Blank** (aqueous sample)**
Volatile Organic Compounds*	USEPA Method 8260C	Part 375 Unrestricted SCOs or Method Detection Limit	216	11	11	11
Semivolatile Organic Compounds*	USEPA Method 8270D	Part 375 Unrestricted SCOs or Method Detection Limit	216	11	11	11
Pesticides*	USEPA method 8081B	Part 375 Unrestricted SCOs or Method Detection Limit	216	11	11	11
Inorganics*	USEPA Method 6010D, 6020B, 7000A	Part 375 Unrestricted SCOs or Method Detection Limit	216	11	11	11
Mercury	USEPA Method 7174B	Part 375 Unrestricted SCOs or Method Detection Limit	216	11	11	11
Polychlorinated Biphenyls (Total PCBs)	USEPA Method 8082A	Part 375 Unrestricted SCOs or Method Detection Limit	296	15	15	15

Aqueous							
Analyte	**Method**	**Minimum Reporting Limits**	**Ground Water**	**Trip Blank*****	**MS/MSD****	**Duplicate****	**Field Blank****
Volatile Organic Compounds*	USEPA Method 8260C/8260C-SIM	AWQS or Method Detection Limit	8	2	1	1	1
Semivolatile Organic Compounds*	USEPA Method 8270D/8270D-SIM (LVI)	AWQS or Method Detection Limit	8	2	1	1	1
Pesticides*	USEPA method 8081B	AWQS or Method Detection Limit	8	2	1	1	1
Inorganics*	USEPA Method 6010D, 6020B, 7000A	AWQS or Method Detection Limit	8	2	1	1	1
Mercury	USEPA Method 7470A	AWQS or Method Detection Limit	8	2	1	1	1
Polychlorinated Biphenyls (Total PCBs)	USEPA Method 8082A	AWQS or Method Detection Limit	8	2	1	1	1

NOTES:

* - Refer to Section 3.5 of the OU-2 Remedial Investigation Work Plan for listed PCOIs

**Collected at a rate of 1 per 20 field samples for each sample matrix.

***Laboratory-supplied trip blanks will accompany all shipments of field samples that include analysis for Volatile Organic Compounds

USEPA - United Stated Environmental Protection Agency

SCO - Soil Cleanup Objective

Table 4
Sample Containers, Preservation Requirements, and Holding Times
Operable Unit No. 2 (OU-2) Remedial Investigation Work Plan
688-700 Court Street, Brooklyn, NY

Non-Aqueous Matrix (Soil)			
Analysis	**Container Requirements**	**Preservation Requirements**	**Holding Times***
Volatile Organic Compounds	3 Encore samplers	No preservative/ Cool to 4 ° C	48 Hours, 14 days to analyze extract
Semi-Volatile Organic Compounds	4 oz glass container	No preservative/ Cool to 4 ° C	14 days
Pesticides	4 oz glass container	No preservative/ Cool to 4 ° C	14 days
Inorganics	4 oz glass container	No preservative/ Cool to 4 ° C	180 days
Mercury	4 oz glass container	No preservative/ Cool to 4 ° C	28 days
Polychlorinated Biphenyls (PCBs)	4 oz glass container	No preservative/ Cool to 4 ° C	14 days
Aqueous Matrix			
Analysis	**Container Requirements**	**Preservation Requirements**	**Holding Times***
Volatile Organic Compounds	3 x 40 ml VOA Vials	HCl to pH<2/ Cool to 4 ° C	14 days
Semi Volatile Organic Compounds	2 x 250 ml Amber Glass	No preservative/ Cool to 4 ° C	7 days
Pesticides	2 x 500 ml Amber Glass	No preservative/ Cool to 4 ° C	7 days
Inorganics	500 ml Plastic	HNO_3 to pH<2/ Cool to 4 ° C	180 days
Mercury	500 ml Plastic	HNO_3 to pH<2/ Cool to 4 ° C	28 days
Polychlorinated Biphenyls (PCBs)	2 x 500 ml Amber Glass	No preservative/ Cool to 4 ° C	7 days

NOTES:

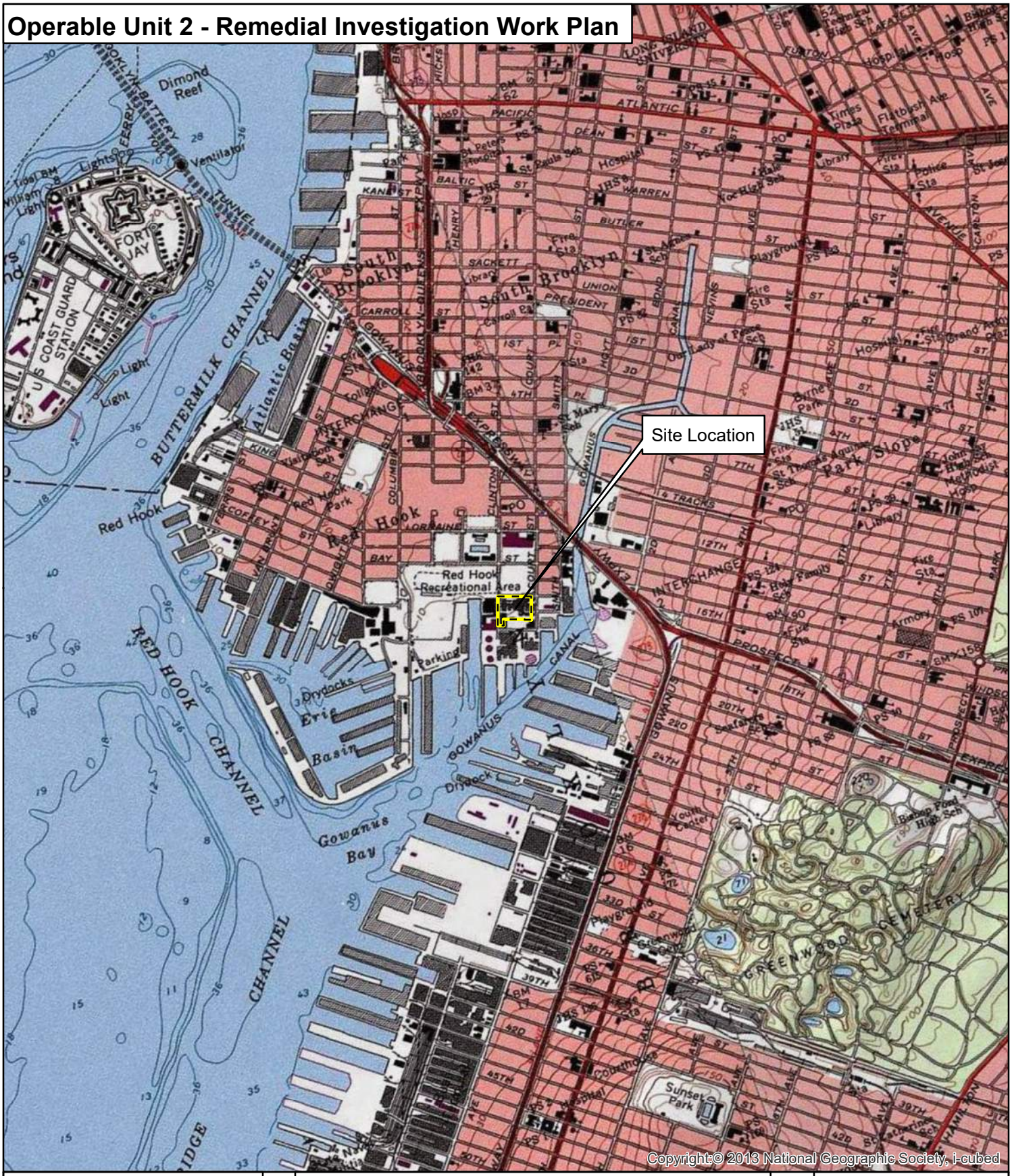
* Holding time begins at time of sample collection

C - Celsius

ml - milliliter

FIGURES

Operable Unit 2 - Remedial Investigation Work Plan



USGS Topographic Map

688-700 Court Street
Brooklyn, NY

FIGURE 1

Legend

Site Boundary

0 800 1,600 3,200 Feet

N

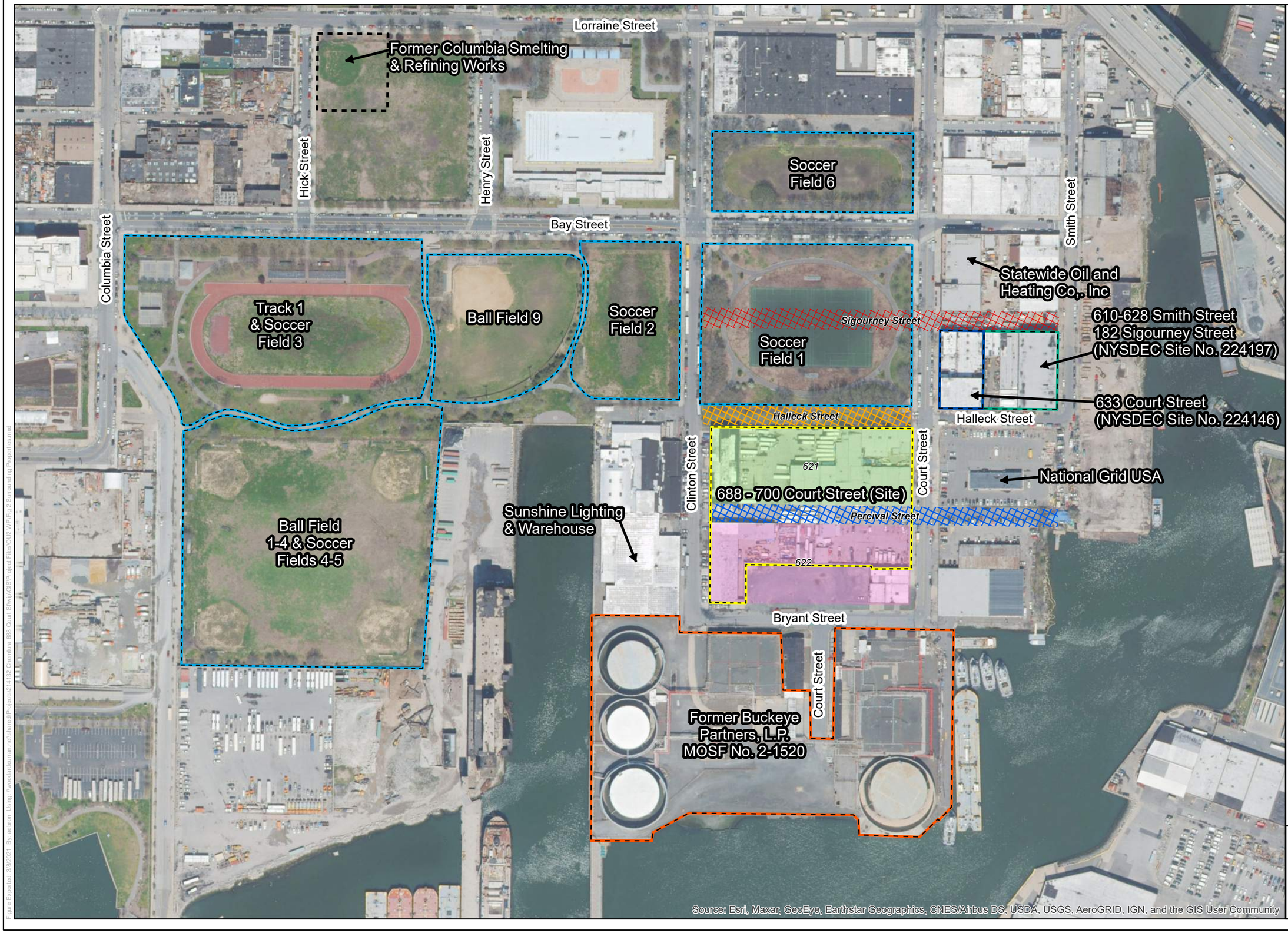
WOODARD &CURRAN

Project #: 214132
Map Created: March 2021

Figure Exported: 3/8/2021 By: aebron Using: \\woodardcurran.net\shared\Projects\214132 Chemtura 688 Court St\wip\GIS\Project Files\OU2 WP\Fig 1 USGS Topo.mxd

Site and Surrounding Area

FIGURE 2



Legend

- Approximate Site Boundary
- Red Hook Recreation Area

Historical Streets

- Halleck Street
- Percival Street
- Sigourney Street

Historical Tax Blocks

- 621
- 622

Reference
EDR Sanborn Map, Brooklyn, NY Vol 1; Dated 1915

Note:
Location of Columbia Smelting & Refining Works is approximate

0 70 140 280 Feet

WOODARD &CURRAN

Project #: 214132
Map Created: March 2021

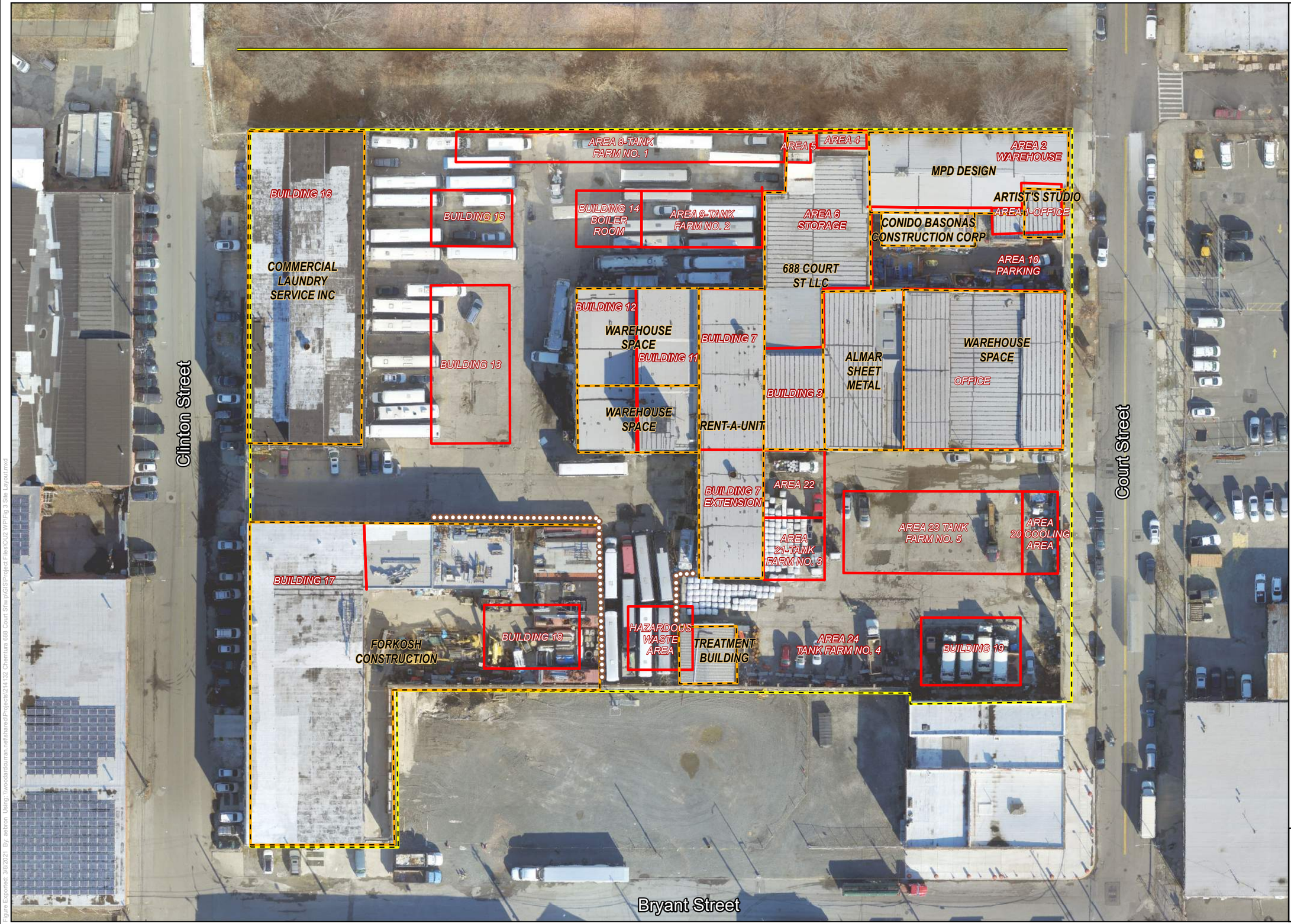
Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk.

Operable Unit 2 Remedial Investigation Work Plan

688-700 Court Street
Brooklyn, NY

Current and Former Site Layout

FIGURE 3



Legend

- Stone Separator Wall
- Tenants
- Historical Buildings
- Site Boundary
- Boundary between Halleck Street & Red Hook Park

Reference:

1998 Flour Daniel GTI Phase I Environmental Site Assessment, Site Layout; Dated March 9, 1998

0 35 70 Feet

WOODARD &CURRAN

Project #: 214132
Map Created: March 2021

Orthography based on photographs taken on December 27, 2018

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk.

Operable Unit 2 Remedial Investigation Work Plan

688-700 Court Street
Brooklyn, NY

Figure Exported: 3/8/2021 By: aebron Using: \\woodardcurran.net\shared\Projects\214132 Chemtura 688 Court St\wip\GIS\Project Files\OU2 WP\Fig 3 Site Layout.mxd

Historical Sample Locations

FIGURE 4

Clinton St

Court St

Soccer Field 1

FAR-FIELD 1
FAR-FIELD 2
FAR-FIELD 3

MW-107
MW-108
MW-109
MW-110

SC-SB/MW-01
MW-01
MW-02

ZC-04 ZC-06 ZC-08 ZC-10 ZC-12

ZB-03 ZB-05 ZB-07 ZB-09 ZB-11

ZA-02 ZA-04 ZA-12

Z-02 Z-03 Z-04 Z-05 Z-06 Z-07 Z-08 Z-09 Z-10 Z-11 Z-12

Y-02 Y-03 Y-04 Y-05 Y-06 Y-07 Y-08 Y-09 Y-10 Y-11 Y-12 Y-13

P-01 P-02 P-03 P-04 P-05 P-06 P-07 P-08 P-09 P-10 P-11 P-12 P-13 P-14

O-25 O-01 O-02 O-03 O-04 O-05 O-06 O-07 O-08 O-09 O-10 O-11 O-12 O-13 O-14

Legend

- Groundwater Monitoring Well
- WSP Sample Locations
- Boundary between Red Hook Park & Halleck Street
- Red Hook Recreation Area

0 15 30 60 Feet

WOODARD &CURRAN

Project #: 214132
Map Created: February 2021

Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk.

Operable Unit 2 Remedial Investigation Work Plan

688-700 Court Street
Brooklyn, NY

Figure Exported: 3/19/2021 By: aebron Using: \\woodardcurran.net\shared\Projects\214132 Chemtura 688 Court St\wip\GIS\Project Files\OU2 WP\Fig 4 Historical Sample Locations.mxd

Operable Unit 2 (Off-Site Subsurface/ Groundwater) Proposed Sample Locations

FIGURE 5

Extent of OU-2 Investigation

FAR-FIELD 1

ZC-04 ZC-06 ZC-08 ZC-10 ZC-12

OU2-SB-01/WC-MW-15

ZB-03 OU2-SB-02 ZB-05 OU2-SB-03 ZB-07 OU2-SB-04 ZB-09 OU2-SB-05 ZB-11 OU2-SB-06

ZA-02 ZA-04 OU2-SB-08 OU2-SB-09 OU2-SB-10 OU2-SB-11 ZA-12

OU2-SB-07/WC-MW-16

OU2-SB-18/WC-MW-17

OU2-SB-12 Z-02 Z-03 Z-04 Z-05 Z-06 Z-07 Z-08 Z-09 Z-10 Z-11 Z-12

OU2-SB-13 OU2-SB-14 OU2-SB-15 OU2-SB-16 OU2-SB-17

Y-02 Y-03 Y-04 Y-05 Y-06 Y-07 Y-08 Y-09 Y-10 Y-11 Y-12 Y-13 OU2-SB-24

OU2-SB-19 OU2-SB-20 OU2-SB-21 OU2-SB-22 OU2-SB-23

MW-01 MW-02

P-01 P-02 P-03 P-04 P-05 P-06 P-07 P-08 P-09 P-10 P-11 P-12 P-13 P-14

OU2-SB-25/WC-MW-18 OU2-SB-26 OU2-SB-27/WC-MW-19 OU2-SB-28 OU2-SB-29/WC-MW-20

O-25 O-01 O-02 O-03 O-04 O-05 O-06 O-07 O-08 O-09 O-10 O-11 O-12 O-13 O-14

OU2-SB-30 OU2-SB-31 OU2-SB-32 OU2-SB-33 OU2-SB-34 OU2-SB-35

N-25 N-01 N-02 N-03 N-04 N-05 N-06 N-07 N-08 N-09 N-10 N-11 N-12 OU2-SB-37

MW-09 OU2-SB-36

EW-15 WC-MW-4I EW-17 EW-18

M-01 M-04 M-05 M-06 M-07 M-08 M-09 M-10 M-11 M-12 M-16

EW-16 EW-35 EW-36

L-25 L-01 L-02 L-03 L-04 L-05 L-06 L-07 L-08 L-09 L-10 L-11 L-12

Legend

- Groundwater Monitoring Well

Proposed Sample Locations

- Soil Boring
- Soil Boring (Sampling for PCB's only)
- Boring and Groundwater Monitoring Well
- WSP Boring Locations
- OU-2
- Boundary between Red Hook Park and Halleck Street

Note: Proposed boring ID's are for planning purposes and are subject to change

0 10 20 40 Feet

WOODARD &CURRAN

Project #: 214132
Map Created: March 2021
Orthography based on photographs taken on December 27, 2018

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk.

Operable Unit 2 Remedial Investigation Work Plan

688-700 Court Street
Brooklyn, NY