Remedial Action Plan

Former Meriden Hospital
1 King Place, Meriden

City of Meriden
Economic Development
Meriden, Connecticut

June 2017

146 Hartford Road
Manchester, Connecticut 06040

Project No. 20120232.C60

FUSS & O'NEILL

June 13, 2017

Ms. Juliet Burdelski
City of Meriden
Economic Development
142 East Main Street
Meriden, Connecticut 06450

RE: Remedial Action Plan
Former Meriden Hospital
1 King Place, Meriden, CT

Dear Ms. Burdelski:

We are pleased to submit the enclosed Remedial Action Plan (RAP) for the above-referenced Site. This RAP presents the remedial strategy proposed to meet the clean-up objectives in the Connecticut Department of Energy and Environmental Protection's (DEEP's) Remediation Standard Regulations (RSRs).

Please contact the undersigned if we can be of further assistance.

Sincerely,

Stefanie K. Wierszchalek
Hydrogeologist

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1 Introduction

On behalf of the City of Meriden (the City), Fuss & O'Neill, Inc. has prepared this Remedial Action Plan (RAP) for the former Meriden Hospital located at 1 King Place (the Site), in Meriden, Connecticut. A portion of a United States Geological Survey (USGS) topographic map showing the Site location is provided as *Figure 1* (USGS, 1992).

This RAP summarizes the proposed remedial strategy for the Site in anticipation of the sale of the property to the City's Preferred Developer for the Site (One King LLC).

1.1 Redevelopment Overview

According to City records, the Site currently comprises an approximate 5.64-acre, irregularly-shaped parcel that has been owned by the City of Meriden since 2014. The Site consists of a vacant hospital building, a parking garage, an asphalt parking lot, and landscaped areas. An aerial image depicting the property boundary, main building located east of King Place, and the parking lot located west of King Place is provided as *Figure 2*.

The Site will be redeveloped by retaining and restoring the approximately 327,600 square foot former hospital building. Currently, there is no building demolition planned, with the exception of the demolition of the existing smoke stack (located south of the boiler room) which will be razed prior to the sale of the property. A complete gut and renovation of the building mechanical as well as roofs and common areas are anticipated.

The current development plan is to utilize a multi-phased, multi-use, and multi-tenant approach for the property. The Site building will be subdivided with housing, senior housing, medical offices and community services as the anchors. Remaining space in the building will be leased to tenants that have synergy with the anchor tenants including:

- health services/medical offices
- medical laboratories
- a cafeteria
- a pharmacy
- a coffee kiosk
- a temperature-controlled storage facility
- firehouse
- various retailers; including a grocery store
- restaurant
- residential apartments

In addition to the redevelopment of the Site building, the development plan includes maintaining and restoring the parking deck located west of King Place, as well as expanding the existing surface parking areas. This will most likely include removal of the former helipad area located west of King Place.

These uses are keeping the City's redevelopment goal for the Site which is a mixed use private development that includes housing and commercial uses which will create jobs.

1.2 Remedial Strategy Overview

It is our current understanding that the City of Meriden intends to enter the Site into an appropriate regulatory program. Once formally entered into the program, the Site will be subject to Connecticut's Remediation Standard Regulations (RSRs).

The remedial strategy to meet the objectives for the Site includes the following:

1. Enter Site into a regulatory cleanup program
2. Submittal of remediation schedule & Public notification (per program requirements)
3. Abatement of hazardous building materials & removal of mechanical equipment to make the interior release areas accessible
4. Demolition of exterior smoke stack
5. Removal of existing Underground Storage Tanks
6. Excavation of petroleum-impacted soil (associated with USTs or drywell located south of boiler room)
7. Removal of free-phase petroleum product from floor surface in boiler room & adjacent areas
8. Excavation of PCB-impacted soils from boiler room interior
9. Cleaning or sawcutting and removal of PCBs & Petroleum impacted portions of interior concrete floors
10. Rendering contaminated fill inaccessible to achieve compliance with the RSR criteria during Site redevelopment activities
11. Post remediation groundwater monitoring (as necessary)
12. File an Environmental Land Use Restriction (ELUR) on the land records
13. File a Licensed Environmental Professional Verification

2 Site Overview

This section provides a summary of the information used to construct the conceptual model for the Site. Information such as the Site's operational history, geology, hydrogeology, and potential receptors help identify areas where releases of hazardous materials could occur and how they might impact human health and the environment.

2.1 Physical Description

The Site, 1 King Place, is located on the west side of Cook Avenue in a commercial (C1A) zone of Meriden, in New Haven County, Connecticut (*Figure 1*).

According to City records, the Site is a 5.64-acre irregularly-shaped parcel that has been owned by the City of Meriden since 2014. The Site consists of a vacant hospital building, a parking garage, an asphalt parking lot, and landscaped areas. An aerial depicting the property boundaries and existing Site layout is provided as *Figure 2*.

The Site has been vacant and abandoned since approximately 1990, the Site utilities have been disconnected, and electrical transformers were removed. The property is connected to municipal sewer and water (provided by the City of Meriden Water Pollution Control Division and Water Division, respectively), natural gas (provided by Yankee Gas) and electricity provided by Connecticut Light and Power.

Based on observations made during Site visits and available mapping, properties surrounding the Site appeared primarily residential in nature. West Cemetery is located across Orange Street, north of the Site.

2.2 Site History

The central portion of the Site was developed with a small hospital as early as 1901, with residential structures occupying the remaining portions of the Site east of King Place, and a public school west of King Place. Since that time, the residential structures were razed and multiple iterations of building additions and extensive building expansions occurred at the Site from approximately the 1930s through the 1980s. The public school, formerly located in the southwest portion of the Site was razed in approximately 1979 and was replaced with a parking lot and later a three-tiered parking garage. The last remaining residential buildings on the Site, located at the southeast corner of the Site near the intersection of Cook Avenue and Bronson Avenue, were demolished in 2007.

The Site operated as the Meriden-Wallingford Hospital until it closed in approximately 1992. The property has remained vacant since that time.

Locations of historical and existing Site features are depicted on *Figure 2*.

2.3 Environmental Setting

2.3.1 Topography & Geology

The regional topography is hilly but generally slopes down to the south and west toward Harbor Brook and the Quinnipiac River (*Figure 1*). Similarly, the topography of the Site generally slopes down to the south towards Harbor Brook; located approximately 500 feet south of the Site (USGS, 1992).

Surficial Geology

Surficial material at the Site is mapped as valley train deposits, which are a stratified drift that generally consists of sand overlying fines, which include silt and clay (Hanshaw, 1962). Surficial materials consistent with those described above were identified during the advancement of soil borings at the Site. In addition, historic fill materials (containing brick, asphalt fragments, coal and ash) were observed at varying thicknesses in the southern portions of the Site. Specifically, sampling locations advanced in the

southern portion of the parking area west of King Place had fill identified from approximately 0.5 to 6 feet below grade.

Bedrock Geology

Bedrock beneath the Site is mapped as New Haven Arkose, a reddish medium- to coarse-grained sedimentary rock known locally as brownstone (Rodgers, 1985). Bedrock was not encountered during previous investigation activities and is estimated to be greater than 25 feet below grade.

2.3.2 Hydrogeology

Depth to groundwater at the Site ranges from approximately 8 to 17 feet below grade. Depth to groundwater measurements were used to calculate groundwater elevation and ultimately to determine that groundwater at the Site generally flows to the east/southeast.

It is noted that several structures were formerly located in the southeastern corner of the Site. Documentation of the demolition of these structures was not obtained as part of this investigation and therefore determination of how below grade basements were backfilled cannot be made. The presence of foundations or other underground features related to these former structures as well as demolition debris used as basement backfill may have the potential to affect groundwater flow in this portion of the Site. Utility corridors containing water, storm water and sewer services may also serve as preferential flow migration pathways that can affect local groundwater flow.

2.3.3 Water Quality Classifications

Groundwater Classification

The quality of groundwater beneath the Site is classified by the CT DEEP as GB; which is identified as groundwater that may not be suitable for human consumption without treatment due to waste discharges, spills, leaks of chemicals, or land use impacts (DEEP, 2011).

Surface Water Classification

The nearest surface water body, Harbor Brook, is located approximately 500 feet south of the Site (USGS, 1992). Harbor Brook is classified by the State of Connecticut as class B; which is identified as surface waters that are known or presumed to be suitable for the following designated uses: recreational use, fish and wildlife habitat, agricultural and industrial supply, and other legitimate uses (DEEP, 2011).

2.3.4 Potential Receptors

A preliminary assessment was conducted to evaluate whether sensitive human health or ecological receptors are present at or directly downgradient of the Site. The results of this evaluation are presented below:

- Endangered Species – No potential threatened or endangered species habitats are present at the Site or within 0.25 miles of the Site (CTECO, 2016).
- Ecological Receptors – An ecological risk assessment has not been conducted; however, the Site is located in a developed area of Meriden and is primarily surrounded by closely spaced residences. The potential for ecological receptors to be impacted by Site conditions is low.
- Wetlands – According to State soil mapping (CTECO, 2016) and observations made during site visits, there are no mapped wetlands located on the Site.
- Surface Waters – The nearest surface water body is Harbor Brook, located approximately 500 feet south/west of the Site. Because of the distance and direction from the Site, Harbor Brook could be affected by potentially impacted groundwater migrating off the Site.
- Aquifer Protection Areas – Two aquifer protection areas were identified within a 0.5-mile radius of the Site (CTECO, 2016); including the Mule Aquifer Protection Area (APA #94) and the Columbus Park Aquifer Protection Area (APA #95), both located approximately 2000 feet north of the Site.
- Public Water Supply Wells – The Atlas of Public Water Supply Sources and Drainage Basins of Connecticut (CTDEEP, 1982) shows no public water supply wells within 0.5-mile radius of the Site.
- Private Water Supply Wells – The Site is located in an urbanized area where municipal water is available to the Site and the surrounding area.
- Physical Contact with Soil – The Site is primarily covered by the Site building or asphalt parking areas (west of King Place), so there is little potential for direct contact with the soil. The potential exists, however, for future Site occupants and visitors to be exposed to impacted soil or fill if redevelopment requires removal of the existing building or asphalt paving.
- Potential for Vapor Intrusion – VOCs are not present in site groundwater at concentrations that could result in potential vapor intrusion into buildings constructed over the groundwater contact plume. Note that additional rounds of groundwater monitoring will be required to evaluate groundwater quality over seasonal trends.

3 Regulatory Framework

3.1 Regulatory Program & RSR Criteria

The Site is not currently entered in a formal regulatory cleanup program, however, the City of Meriden intends on entering the Site into a voluntary program to achieve formal compliance with the Connecticut Remediation Standard Regulations (RSRs).

The RSRs are the clean-up standards in the State of Connecticut and contain procedures to evaluate whether actions (e.g., remediation or institutional controls) will be required to address identified releases

of hazardous substances. The RSR criteria that would be specific to the Site once formally entered into a regulatory cleanup program are discussed in the table below.

RSR Criteria Overview

RSR Soil Criteria	
Direct Exposure Criteria (DEC)	DEC are intended to protect human health from exposure to constituents of concern and are applicable to soil within 15 feet of the ground surface. Soil impacted by a release is typically compared to the residential (Res) DEC unless alternatives or variances (discussed below) are applied.
Pollutant Mobility Criteria (PMC)	The PMC protect groundwater from constituents leaching out of impacted soil and are dependent upon the groundwater quality classification of a site. Since the Site is located in a GB designated area, the GB pollutant PMC were used. The GB criteria apply only to soil located above the seasonal high water table.
RSR Groundwater Criteria	
Surface Water Protection Criteria (SWPC)	The SWPC ensure that surface water quality is not impaired by the discharge of contaminated groundwater into a surface water body. Groundwater at the Site discharges to Harbor Brook.
Volatilization Criteria (VC)	Volatilization criteria protect human health from volatile substances (i.e. VOCs) in shallow groundwater that may migrate into overlying buildings and apply to groundwater within 15 feet of the ground surface (which is applicable at the Site) or a structure intended for human occupancy. The residential (Res) VC apply unless a land use restriction is recorded.

3.2 Common RSR Alternatives

The RSRs also define specific alternatives to compliance with the baseline numeric soil and groundwater criteria by including self-implementing options, exceptions, and variances such as:

1. Inaccessible Soil – The DEC for soil can be waived if the soil is considered inaccessible and an ELUR prohibiting disturbance of such soil is recorded. Inaccessible soil is defined follows:

    - More than four feet below the ground surface
    - More than two feet below a paved surface consisting of at least three-inches of bituminous concrete or concrete, which two feet may include the pavement sub-base
    - Polluted fill beneath a bituminous concrete or concrete surface consisting of at least three-inches of bituminous concrete or concrete if such fill meets the following criteria:
        - Semi-volatile compounds or petroleum hydrocarbons in the fill exceeding the DEC are normal constituents of bituminous concrete
        - Metals in the fill do not exceed two times the applicable DEC
        - No other compounds exceed the DEC
    - Beneath an existing building or DEEP-approved permanent structure

2. Engineered Controls – Section 22a-133k-2(f)(2) of the RSRs provides a variance to the DEC if a DEEP-approved engineered control is installed to physically isolate the underlying soil, thereby minimizing the potential for contact with the soil. The RSRs also provide a variance to the PMC if the DEEP-approved impermeable engineered control is constructed to minimize the migration of liquids through the soil. With an engineered control in place and an ELUR prohibiting unauthorized disturbance of the engineered control recorded, the DEC and/or the PMC do not apply.

3. SPLP Analysis – In order to evaluate the actual leaching potential of constituents of concern (COCs), samples can be analyzed using the synthetic precipitate leaching procedure (SPLP) and, for GB areas, compared to ten times the groundwater protection criteria (GWPC).

4. Environmentally Isolated Soil – Soil beneath buildings that contains contaminants other than VOCs can be considered environmentally isolated. The PMC do not apply to environmentally isolated soils, provided an appropriate ELUR is in place.

3.3 Use of Additional Polluting Substances and/or Alternative Criteria

In instances where a compound has no corresponding promulgated 2013 RSR criteria, the criteria proposed in the *DEEP Recommended Numeric Criteria for Common Additional Polluting Substances and Certain Alternative Criteria* dated December 10, 2015 were used to evaluate compliance. *Section 5.0* identifies Site specific criteria and makes a formal request to the department to approve those specific compounds where a 2013 criteria was not established.

4 Previous Investigations

Previous assessments and investigations performed at the site consist of the following:

- Vanasse Hangen Brustlin, Inc. (VHB), May 2014, *Phase I Environmental Site Assessment,* Former Veteran's Memorial Medical Center, 1 King Place, Meriden, CT

- Fuss & O'Neill, Inc., June 2016, *Phase II/Limited Phase III Environmental Site Assessment*, Former Meriden Hospital, 1 King Place, Meriden, CT

A summary of the results from the investigations is provided below.

4.1 Areas of Concern

The May 2014 Phase I ESA identified the following recognized environmental conditions (RECs) and areas of concern (AOCs), which were investigated during the 2016 Phase II/Limited Phase III ESAs:

- Northern UST Area (Courtyard)

  A 5,000-gallon #2 fuel oil UST was installed in 1982 on the north side of the hospital building and was connected to a back-up generator. The tank was removed in March 1999, at which time, polluted soil was also removed. Confirmatory soil samples were collected and indicated the presence of petroleum hydrocarbons at levels below applicable clean-up criteria. Conflicting information indicated that a 2,000-gallon #2 fuel oil UST was installed in the former tank grave, however, a ground penetrating radar (GPR) survey conducted in this area did not reveal any evidence of a current UST at this location.

- Southern UST Area (South of Boiler Room)

  A 20,000-gallon #6 fuel oil UST was installed in 1968 on the south side of the hospital building adjacent to the boiler room. Later, in 1982, a 2,000-gallon #2 fuel oil UST was installed in this area and connected to a back-up generator, located adjacent to the boiler room inside the Site building. In 1990, the 20,000-gallon UST was reportedly replaced with a 15,000-gallon #6 fuel oil UST; however no documentation of tank closure or sampling was identified. Releases of no. 6 fuel-oil were reported in this area in 1997 and 1998, during tank filling operations.

- Dry Well (adjacent to Southern UST Area)

  A dry well was observed south of the boiler room within the southern UST area. A shallow soil sample collected from this area indicated concentrations of extractable total petroleum hydrocarbons (ETPH) and polynuclear aromatic hydrocarbons (PAHs) exceeding baseline RSR criteria. These concentrations are indicative of a shallow petroleum release in this area.

- Interior Transformers/PCB Equipment (basement of nurses bldg. & main hospital)

  The findings of the previous 2014 Phase I ESA and more recent Site walk identified several areas within the building interior which contained transformers and other potentially PCB-containing electrical equipment. While these areas were primarily located in the basement of the Site building, transformer rooms were also noted in select areas of the upper floors of the building. Locations with observed evidence of current or former transformers are depicted on *Figure 3*.

- Loading Dock (evidence of interior releases)

  Based on the past use of the Site and known shipments of hazardous wastes, the potential exists for a release to have occurred in the loading dock area. Additionally, a 1997 spill report from the fuel oil release indicates that no. 6 fuel oil may have migrated to a catch basin in the loading dock area.

- Various Floor Drains & Sumps (discharge locations unknown)

  Various floor drains and sumps were observed throughout the building; specifically within the former laundry area and areas within the southern portion of the building near the boiler room (*Figure 3*). The discharge location of these drains is unknown.

- Boiler Room

  Several leaking containers were observed within the boiler room within the southern portion of the Site building. The fuel lines from the exterior USTs were observed to be damaged where they entered the building which resulted in a significant release of oil to the interior floor surface.

During the implementation of Fuss & O'Neill's Phase II/Limited Phase III investigation activities in March 2016, the following additional RECs/AOCs were also identified:

- Former Incinerators (2)

  A review of historical Site plans identified at least two former incinerators. The first (presumably the original) was located north of the boiler room in a small area north of the current generator room, west of the former boiler room. The second incinerator was located in a standalone structure located to the east of the loading dock. This incinerator building was likely constructed to replace the former incinerator during an iteration of building renovations.

- Smoke Stack

  A large smoke stack related to the former incinerators is located south of the boiler room in the southern UST area. Residual ash and material was observed within the stack.

- Oil Trenches in Laundry Area (southwest portion of building)

  A review of historical Site floor plans indicated a sub-slab "oil trench" was located within the laundry area in the southwestern portion of the building. According to the floor plans, this trench connected the laundry dryer units along the western side of the laundry area and potentially extended further east to other interior areas.

- Chemical Storage Room in Laundry Area

  A review of historical Site floor plans indicated a chemical storage room was located within the laundry area in the southwestern portion of the building. The specific chemicals and quantities previously stored in this area, however, are unknown.

- Elevator Rooms

  The locations of several elevator rooms were identified during a review of historical site plans. These rooms are enclosed areas in which the mechanics of the elevators, including oil reservoirs are located. Access to the mechanical areas and oil reservoirs is limited. Equipment will need to be removed to fully investigate if a release of oil from the equipment has occurred.

- Switchgear/Generator Room(near courtyard)

  A backup generator/electrical switchgear room was identified adjacent to the northern courtyard. Access to this room is from the courtyard area only.

- Urban Fill

  As with any parcel, located in a heavily urbanized area where former structures have been razed, the potential exists for the presence of urban fill containing ash, coal, asphalt fragments, and demolition debris. Often urban fill materials are found to contain petroleum products and heavy metals due to the presence of ash, asphalt and coal fragments. The Phase II/Limited Phase III investigation activities identified the presence of fill material containing ash and coal in borings advanced in the southern portion of the Site. Thinner layers of fill was observed in borings located in the southern UST area (approximately 1 to 3 feet thick) while borings advanced in the southern parking lot area west of King Place had fill observed at a thickness of 6 feet.

A comprehensive summary of the Site AOCs, AOC-specific conceptual models that include discussions of historical operations, investigations, results, and conclusions are presented in *Table 1* and the approximate AOC locations are shown on *Figure 2*. The building footprint and Phase II/Limited Phase III sampling locations are depicted on *Figure 3.*

4.2 Soil/Concrete Investigation Summary

The Phase II/Limited Phase III investigation identified releases of hazardous materials or petroleum products exceeding RSR criteria at the following AOCs on Site:

- Boiler Room
  A release was identified within the boiler room located along the southern side of the Site building which impacted the shallow sub-slab soil at one boring location (SB-15). Sampling locations and interior features of the boiler room are depicted on *Figure 4*.

- Dry Well & Southern UST Area (South of Boiler Room)
  Both the dry well and southern UST area are depicted on *Figure 4.* A petroleum release was identified in shallow soil adjacent to the dry well located south of the boiler room (SB-12).

  A 20,000-gallon #6 fuel oil UST was installed in 1968 on the south side of the hospital building adjacent to the boiler room. Later, in 1982, a 2,000-gallon #2 fuel oil UST was installed in this area and connected to a back-up generator, located adjacent to the boiler room inside the Site building. In 1990, the 20,000-gallon UST was reportedly replaced with a 15,000-gallon #6 fuel oil UST; however no documentation of tank closure or sampling was identified. Releases of no. 6 fuel-oil releases were reported in this area in 1997 and 1998, during tank filling operations.

  Although two USTs exist in this area, only a 10,000-gallon heating oil UST is currently registered for the Site with an installation date of August 1977 and a 15-year life expectancy. In April 2015, the CT DEEP issued a notice of violation (NOV) for the tank exceeding its life expectancy and for the UST registration not being up to date. Following receipt of the NOV, the City of Meriden retained Fuss & O'Neill to evaluate the status of these tanks and soil samples collected from the vicinity of these tanks did not identify concentrations of contaminants that would indicate a release had occurred.

- Concrete Interior Floors - Equipment/Elevator/Transformer Rooms
  Petroleum and PCB releases were identified to have impacted the concrete floors in several areas throughout the Site building. The source for the PCBs is inferred to be derived from leaks from former or current equipment such as transformers, elevators or electrical equipment. Severe oil staining or residual oil was not observed on the floor in these areas.

- Impacted Urban Fill
  Varying thicknesses of urban fill was identified across the Site. Fill material was identified to be impacted with concentrations of metals and PAHs.

A summary of the results from the Phase II/Limited Phase III investigation which identified releases exceeding RSRs is provided in the sections below per AOC.

4.2.1 Boiler Room

As part of the Phase II/Limited Phase III investigations, a boring was advanced by hand in the southeast portion of the boiler room (SB-15) and soil samples were collected from 1-3 fbg and 3-5 fbg. Laboratory analytical results indicated an elevated concentration of PCBs (180 mg/kg) was detected in the shallow soil sample collected from 1-3 fbg at SB-15. Concentrations of PAHs were also identified at levels exceeding baseline RSR criteria within this sample and ETPH and select VOCs (including 1,2,4-trimethylbenzene and naphthalene) were also detected at concentrations that are below baseline RSR criteria in this sample.

Considering visual evidence of petroleum impact was observed in the boring log at this location, these concentrations are likely attributable to a petroleum release beneath the slab floor of the boiler room.

Additional borings were advanced in accessible areas within the vicinity of SB-15 in an effort to delineate the extent of PCB-impacted soil, however PCBs were not detected above laboratory reporting limits in these samples. Therefore, the shallow impacted soil is limited to an area measuring approximately 10 x 10 feet as depicted on *Figure 4*.

Remedial planning for this area will also include the cleaning and appropriate disposal of residual gross petroleum product remaining (likely a result of equipment vandalism) from the floor within the boiler room and on the second floor in the vicinity of the boiler room.

4.2.2 Dry Well & Southern UST Area (South of Boiler Room)

A concentration of ETPH exceeding the Res DEC was reported in the sample from SB-12 (1.75-2'), located adjacent to the dry well south of the boiler room. Concentrations of PAHs were also identified at levels exceeding baseline RSR criteria at this sampling location. These detections are likely indicative of a petroleum release to the drywell.

Additionally, it is noted that two USTs (one 10,000-gallon and one 2,500-gallon) are located just south of the drywell in this portion of the Site (*Figure 4*). In April 2015, the CT DEEP issued NOV UST-GB15-

0067 for a tank beyond its life expectancy and for the UST registration not being up to date. While COCs were not identified in soil samples collected from around the USTs, it is noted that these tanks are beyond their respective life expectancies and should be removed.

Overall, remedial planning goals for this area focus on removing the USTs and associated piping and excavating any impacted soil that may be encountered either associated with the USTs or the adjacent drywell.

4.2.3 Interior Concrete Floors (Equipment/Elevator/Transformer Rooms)

Phase II/Limited Phase III investigations identified concentrations of petroleum hydrocarbons and PCBs in concrete chip samples collected from the floor at select accessible locations. Specifically, concentrations of PCBs at three sampling locations; CC-18, CC-19 and CC-21, exceeded 1 ppm, while petroleum hydrocarbons were elevated in at least one other sampling location (CC-14). These elevated concentrations were identified primarily in samples collected from transformer rooms, elevator equipment rooms or electrical rooms between the first and second floors of the Site building.

Remedial planning within these areas will include the cleaning or sawcutting and removal of the impacted portion of the concrete floor at these locations and the appropriate disposal of the cleaning wastewater or concrete debris.

4.2.4 Impacted Urban Fill Material

The highest concentrations of metals, specifically arsenic, cadmium and lead, were detected in borings advanced in the parking lot west of King Place at locations where observations of a thick urban fill material layer (coal, ash, concrete, etc.) was identified. At these locations (SB-28, SB-29, SB-30 and SB-31) concentrations of arsenic, cadmium, copper, lead and/or silver exceeded the baseline Res DEC.

Based on the mass metals results, 10 samples were analyzed for arsenic, cadmium, chromium, copper, lead and/or mercury by the synthetic precipitation leaching procedure (SPLP) to determine their potential to leach into groundwater. Of the samples analyzed, SPLP copper and/or lead were detected in samples from SB-28 and SB-29. Although the detection of SPLP metals indicates the potential for metals to leach into groundwater, all of these concentrations were below the baseline GB PMC. Per Section 22a-133k-2(c)(4)(B) of the Connecticut RSRs, however, the pollutant mobility criteria does not apply to polluted fill that is impacted with coal ash, coal fragments or any combination thereof; provided that the fill is not impacted with any VOCs that exceed applicable criteria.

As such, remedial planning for the Urban Fill will be addressed during Site redevelopment activities and will contemplate alternatives and options for achieving compliance with the DEC. Such options include covering the impacted fill material with appropriate thicknesses of surface pavement or clean cover material beneath landscaped areas in accordance with the RSRs.

Based on observations made during drilling activities, the fill layer identified in soil borings advanced within the parking area west of King Street is generally thicker (up to 10 feet thick in some borings) while thinner layers were identified in select borings east of King Street.

4.3 Groundwater Investigation Summary

Analytical results from groundwater sampling events conducted at the Site between March and May 2016, indicates that a significant release to groundwater has not occurred.

Specifically, six groundwater samples were collected from the four newly installed monitoring wells and two previously existing monitoring wells were submitted to Phoenix Analytical Laboratories (Phoenix) for laboratory analysis of PAHs, Metals, VOCs and/or PCBs.

Low levels of barium, below the baseline GWPC were detected in each of the groundwater samples collected. A trace concentration of lead was also detected in the sample collected from MW-02, located adjacent to Cook Avenue along the east central property boundary. These concentrations of metals were below applicable RSR criteria.

No other constituents of concern were detected above laboratory reporting limits in any of the groundwater samples. Since VOCs were not detected above laboratory reporting limits in groundwater, there is no evidence to indicate a potential vapor intrusion risk at the Site exists.

4.4 Previous Remediation

A review of the available historical documentation indicated the removal of a 5,000-gallon diesel UST from the northern courtyard in 1999. Although no visual or olfactory signs of petroleum impact were observed, evidence of vapor-phase volatile organic compounds was detected in the soil remaining along the east side of the excavation area. Approximately 8 cubic yards of soil was removed from along the east sidewall as a conservative measure, and confirmation samples were collected. While low level concentrations of petroleum hydrocarbons remained in soil, subsequent groundwater monitoring did not identify concentrations of constituents of concern.

Additionally, in March 2016 Fuss & O'Neill EnviroScience subcontracted True Blue Environmental Services of Wallingford, Connecticut to remove and dispose of hazardous and non-hazardous materials remaining within the vacant building at the Site. Materials removed from the Site included fuel treatment, diesel, grease, solvents, toluene and adhesives.

5 Additional Polluting Substances Request

The purpose of this section is to formally request approval by DEEP to establish and use site-specific criteria for several additional polluting substances to evaluate compliance with the RSRs.

As outlined in the table below, we are requesting approval of DEEP's pre-evaluated alternative criteria for several additional polluting substances at the Site, for which no 2013 promulgated criteria exists. Based on the December 2015 "Technical Support Document: Recommended Numeric Criteria for Common Additional Polluting Substances and Certain Alternative Criteria", we are submitting this request to obtain numeric criteria for evaluating additional polluting substances identified in Site soil. The DEEP Request for Approval of Criteria for Additional Polluting Substances and Certain Alternative Criteria form is attached as *Appendix A*.

With respect to each of the compounds listed below, none of the requested criteria were established in the 1996 version of the RSRs, but numeric criteria were calculated by DEEP as part of the technical document referenced above.

CONSTITUENT	Soil		Groundwater	
	GB PMC	Res DEC	Res VC	SWPC
	(mg/kg)	(mg/kg)	(ug/L)	(ug/L)
VOCs (ug/kg)				
1,2,4-Trimethylbenzene	28	500	940	150
PAHs total (ug/kg)				
Acenaphthene	84	1,000	30,500	150
Benzo(ghi)perylene	1	8.4	---	150
Chrysene	1	84	---	0.54
Indeno (1,2,3-cd) pyrene	1	1	---	0.54
2-Methylnaphthalene	5.6	270	13100	62

Notes:
Requested criteria represents the 2015 recommended numeric criteria for Additional Polluting Substances

6 Remedial Approach

Conditions at the Site for which remediation or other action is required to meet the RSRs is summarized in *Section 3.2 and Section 3.3*. The remedial strategy to meet the objectives includes the following:

The remedial strategy to meet the objectives for the Site are outlined below into two categories – tasks to occur prior to the sale of the property to the developer and tasks to occur following the sale of the property. The pre-sale tasks will be conducted by the City of Meriden while tasks to occur following the sale of the property will be addressed during proposed development activities.

Tasks Prior to Sale of Property

1. Enter Site into a regulatory cleanup program
    a. Submittal of remediation schedule & Public notification (per program requirements)
2. Abatement of hazardous building materials & removal of mechanical equipment to make the interior release areas accessible
3. Demolition of exterior smoke stack
4. Removal of existing Underground Storage Tanks
    a. Includes removal of residual product and cleaning UST by remediation contractor
    b. Includes removal of accessible piping associated with UST systems
    c. Includes structural analysis of adjacent building foundations and shoring during excavation if warranted
5. Excavation of petroleum-impacted soil (associated with USTs and drywell located south of boiler room)
6. Excavation of PCB-impacted soils from boiler room interior
7. Removal of free-phase petroleum product from floor surface in boiler room & adjacent areas
8. Cleaning or sawcutting and removal of PCBs and Petroleum impacted areas of interior concrete floors

Tasks Following Sale of Property

9. Rendering contaminated fill inaccessible or through an engineered control variance approval by DEEP to achieve compliance with the RSR criteria during Site redevelopment activities
10. Post remediation groundwater monitoring (as necessary)
11. File an Environmental Land Use Restriction (ELUR) on the land records
12. File a Licensed Environmental Professional Verification and Verification Report

As described previously, 4 AOCs have been identified that require remediation. As previously mentioned, the impacted urban fill will need to be addressed during Site development activities. Each of the remedial objectives identified above that will be implemented for each of the AOCs is described in the following subsections.

The remedial options described below are based on the following assumptions:

1. Site Grades: Site grades will not be raised. Polluted fill will be capped in place with the proposed development

2. Stack Demolition: The smoke stack and associated foundation footings, located along the exterior of the Site building, south of the boiler room, will be razed and removed from the Site prior to the commencement of UST removal or soil excavation activities.

3. Accessibility: Any equipment or apparatus remaining within the building interior or in the proposed remedial areas will be removed prior to the commencement of remediation activities and all remedial areas will be accessible.

4. Restoration: Remediation areas following removal of polluted soil will be restored to original grade. Portions of the interior floor areas that are removed to achieve remedial objectives will be backfilled to grade and left as is in order for the developer to choose the appropriate restoration method.

6.1 Boiler Room Release Area

The boiler room release area is limited to a localized area of sub-slab soil in the southeastern corner of the boiler room. This release area also includes the gross residual petroleum product on the floor surface in the northwest corner of the boiler room and directly above on the second floor.

The current redevelopment plan intends to maintain the building footprint as is, therefore the following options will be implemented to achieve the remedial objectives:

1. Abate hazardous asbestos containing materials in the boiler room area.
2. Remove and dispose of equipment in the boiler room to the extent necessary to make the target remedial areas accessible.
3. Remove residual gross petroleum product from the floor surface in two locations, dispose appropriately and steam clean the floor surfaces.
4. Sawcut and remove an approximately 15 x 15-foot portion of the concrete slab floor to expose PCB impacted soil.
5. Excavate PCB-impacted soil to a depth of approximately 3 feet below grade and off-site disposal as PCB remediation waste.
6. Collection and laboratory analysis of confirmatory soil samples on a 5-foot grid across the excavation area (assuming approximately 16 samples) using the procedure outlined in 40 CFR 761 Subpart O.
7. Restore the area to original grade with clean soil.

6.2 Southern USTs & Drywell Release Area

The southern UST area is located south of the boiler room and east of the Site loading dock. Adjacent to the USTs is a drywell, located along the exterior of the boiler room, and a smoke stack along the southeast corner of the boiler room exterior. The two USTs located in this area have exceeded their life expectancy and will be removed. As the tanks are removed, the soils will be screened for evidence of a release, and, if observed, impacted soil will be excavated. Concurrently with the UST removal, petroleum-impacted soil identified adjacent to the drywell will also be excavated and removed. We anticipate that this effort will result in the removal of the drywell.

Assuming the smoke stack will be demolished by others prior to the commencement of remedial activities, the following options will be implemented to achieve the remedial objectives at this area:

1. Removal and off-site disposal of the existing pavement/concrete.

2. Implementation of any shoring deemed necessary to protect the adjacent building foundation and retaining walls.
3. Cleaning, removal and disposal of the drywell and two USTs (one 10,000-gallon and one 2,500-gallon) and the associated piping.
4. Excavation of petroleum impacted soil from drywell area and any petroleum impacted soil encountered during UST removal.
5. Collection of confirmatory soil samples and laboratory analysis (assumes 10 samples)
   Sidewall Samples: 1 sample per 20 linear feet of sidewall (with a minimum of 1 sample per sidewall)
   Bottom Samples: 1 sample per 20 by 20 foot area
6. Backfilling tank grave and excavation area to original grade.
7. Post excavation groundwater monitoring to assess the effectiveness of UST removal and impacted soil excavation activities.

The target excavation area for removal of petroleum contaminated soil associated with the drywell is anticipated to be approximately 2-6 feet below grade. Although previous soil sampling did not identify petroleum impacted soil around the USTs, the area beneath the tanks was not accessible for evaluation. Therefore, should petroleum impacted soil be encountered, it is anticipated to be at a depth consistent with the bottom of the tanks, between 10-12 feet below grade. Excavation depth may be limited by the foundation and footing of the building.

Although the excavation areas are not expected to extend below the water table, a specification for dewatering will be included should dewatering be required.

6.3 Interior Concrete Floors – Petroleum & PCB Areas

The findings from the Phase II/Limited Phase III ESA identified several areas within the building that contained transformers, other potentially PCB-containing electrical equipment, and elevator equipment rooms. Concrete chip samples collected from select accessible locations had concentrations of PCBs over 1 ppm at three sampling locations (CC-18, CC-19 and CC-21) and elevated ETPH concentrations at two locations (CC-14 and CC-18). These sampling areas were primarily located in transformer rooms, elevator equipment rooms or electrical rooms.

The following options will be implemented to achieve the remedial objectives at these select areas within the building interior:

1. Removal and disposal of equipment to the extent necessary to make the target remedial areas accessible.
2. The cleaning or sawcutting and removal of the select sampling locations where concrete was identified to be impacted with PCBs and/or ETPH
3. The appropriate disposal of washwater and concrete debris from these areas

It is noted that releases to the subsurface below the building slab may have occurred at additional areas within the building that were previously inaccessible. Such areas, including the oil utility trenches in the laundry room area and various floor drains throughout the building, will need to be evaluated and addressed as they are encountered during building redevelopment activities.

7 Post-Remediation Requirements

Post-remediation tasks to be conducted at the Site include:

- Preparing a remediation summary report & UST closure documentation
- Post remediation groundwater monitoring
- Environmental Land Use Restriction
- LEP Verification and Verification Report

7.1 Remediation Summary Report

Following site remediation, a report documenting the remedial activities will be prepared. The report will include the following elements:

- Site background
- An overview of remedial objectives
- A summary of remedial activities conducted to achieve the remedial objectives
- Summary tables of confirmatory sampling results
- Figures depicting the Site layout and locations and implemented remedies
- UST closure notification

7.2 Post-Remediation Groundwater Monitoring

Groundwater monitoring will be required at the Site following remediation. A minimum of four sampling events that meet applicable RSR criteria and reflect seasonal variability on a quarterly basis are necessary to demonstrate that groundwater complies with the RSRs. All sampling events used to demonstrate compliance must be conducted after the completion of remediation and within two years of the most recent event used to demonstrate compliance.

A post-remediation groundwater monitoring plan will be prepared under separate cover.

7.3 ELUR

Following site redevelopment, an ELUR will be recorded for the Site to prohibit actions that would expose impacted soil remaining at the Site. The restrictions to be established in the ELUR may include:

1. No demolition of the building or disturbance of the building floor slab which render underlying soil inaccessible and environmentally isolated because such soil poses an unacceptable risk to human health and groundwater quality
2. No unauthorized disturbance of the engineered controls or underlying polluted soil because such soil poses an unacceptable risk to human health and groundwater quality

The ELUR will be prepared in accordance with the latest version of the DEEP's *Environmental Land Use Restriction Guidance Document*. The process of recording an ELUR includes the following:

1. Public notice of the intent to record an ELUR
2. Prepare and submit to the DEEP for administrative and technical review the Application for Environmental Land Use Restriction
3. Review title documents and obtain any necessary subordination agreements
4. Receive DEEP approvals
5. Record the ELUR on the City of Meriden land records
6. Submit to the Commissioner a certificate of title that certifies that each holder of an interest in the property subject to the ELUR has irrevocably subordinated such interest to the ELUR or the Commissioner has waived the requirement for interests that are so minor as to not affect the ELUR.
7. Send a copy of the ELUR by certified mail, return receipt requested, to: the chief administrative officer of the City of Meriden, the chairman of the municipal planning, zoning, or planning and zoning commission, the local Director of Health, and any person who submitted comments on the ELUR during the public notice period. Submit copies of these letters to the DEEP.

7.4 LEP Verification & Verification Report

A Verification Report must be submitted to DEEP to support a verification rendered by an LEP that a Site has been investigated in accordance with prevailing standards and guidelines and that pollution on such property has been remediated in accordance with the RSRs. The purpose of a Verification Report is to present the necessary documentation to support a verification rendered by an LEP. The Verification Report is used by DEEP to assess the applicability and adequacy of the verification. The submission of a verification without the support of a complete and thorough Verification Report will result in either a Notice of Audit or a rejection of the verification.

The Verification Report will be prepared following completion of Site development activities and filing of the ELUR on the land records.

8 Implementation Schedule

A summary of the estimated schedule for site remediation and associated site improvements is as follows:

Date	Remediation Milestone
3rd Quarter 2017	Enter Site into Voluntary Remediation Program
	Perform Public Notice
4th Quarter 2017	Implement pre-sale remediation tasks
TBD	Implement post-sale remediation tasks

9 References

Connecticut Department of Environmental Protection, 1982. *The Atlas of Public Water Supply Sources and Drainage Basins of Connecticut*. CTDEP Natural Resources Center.

Connecticut Department of Environmental Protection, 2002. *Water Quality Standards*; Surface Water Quality Standards Effective December 17, 2002; Ground Water Quality Standards Effective April 12, 1996.

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Rodgers, J., 1985. *Bedrock Geological Map of Connecticut*. Connecticut Department of Environmental Protection, Natural Resources Center, Connecticut Geological and Natural History Survey, in cooperation with the United States Department of the Interior, U.S. Geological Survey.

Stone, J. R., Schafer, J. P., London, E. H. and Thompson, W. B., 1992. *Surficial Materials Map of Connecticut*. Prepared in cooperation with CTDEP, Geological and Natural History Survey.

10 Limitations of Work Product

This document was prepared for the sole use of the City of Meriden, the only intended beneficiaries of our work. Those who may use or rely upon the report and the services (hereafter "work product") performed by Fuss & O'Neill, Inc. and/or its subsidiaries or independent professional associates, subconsultants and subcontractors (collectively the "Consultant") expressly accept the work product upon the following specific conditions.

1. Consultant represents that it prepared the work product in accordance with the professional and industry standards prevailing at the time such services were rendered.

2. The work product may contain information that is time sensitive. The work product was prepared by Consultant subject to the particular scope limitations, budgetary and time constraints and business objectives of the Client which are detailed therein or in the contract between Consultant and Client. Changes in use, tenants, work practices, storage, Federal, state or local laws, rules or regulations may affect the work product.

3. The observations described and upon which the work product was based were made under the conditions stated therein. Any conclusions presented in the work product were based solely upon the services described therein, and not on scientific or engineering tasks or procedures beyond the scope of described services.

4. In preparing its work product, Consultant may have relied on certain information provided by state and local officials and information and representations made by other parties referenced therein, and on information contained in the files of state and/or local agencies made available at the time of the project. To the extent that such files which may affect the conclusions of the work product are missing, incomplete, inaccurate or not provided, Consultant is not responsible. Although there may have been some degree of overlap in the information provided by these various sources, Consultant did not attempt to independently verify the accuracy or completeness of all information reviewed or received during the course of this project. Consultant assumes no responsibility or liability to discover or determine any defects in such information which could result in failure to identify contamination or other defect in, at or near the site. Unless specifically stated in the work product, Consultant assumes no responsibility or liability for the accuracy of drawings and reports obtained, received or reviewed.

5. If the purpose of this project was to assess the physical characteristics of the subject site with respect to the presence in the environment of hazardous substances, waste or petroleum and chemical products and wastes as defined in the work product, unless otherwise noted, no specific attempt was made to check the compliance of present or past owners or operators of the subject site with Federal, state, or local laws and regulations, environmental or otherwise.

6. If water level readings have been made, these observations were made at the times and under the conditions stated in the report. However, it must be noted that fluctuations in water levels may

occur due to variations in rainfall, passage of time and other factors and such fluctuations may effect the conclusions and recommendations presented herein.

7. Except as noted in the work product, no quantitative laboratory testing was performed as part of the project. Where such analyses have been conducted by an outside laboratory, Consultant has relied upon the data provided, and unless otherwise described in the work product has not conducted an independent evaluation of the reliability of these tests.

8. If the conclusions and recommendations contained in the work product are based, in part, upon various types of chemical data, then the conclusions and recommendations are contingent upon the validity of such data. These data (if obtained) have been reviewed and interpretations made by Consultant. If indicated in the work product, some of these data may be preliminary or screening-level data and should be confirmed with quantitative analyses if more specific information is necessary. Moreover, it should be noted that variations in the types and concentrations of contaminants and variations in their flow paths may occur due to seasonal water table fluctuations, past disposal practices, the passage of time and other factors.

9. Chemical analyses may have been performed for specific parameters during the course of this project, as described in the work product. However, it should be noted that additional chemical constituents not included in the analyses conducted for the project may be present in soil, groundwater, surface water, sediments or building materials at the subject site.

10. Ownership and property interests of all documents, including reports, electronic media, drawings and specifications, prepared or furnished by Consultant pursuant to this project are subject to the terms and conditions specified in the contract between the Consultant and Client, whether or not the project is completed.

11. Unless otherwise specifically noted in the work product or a requirement of the contract between the Consultant and Client, any reuse, modification or disbursement of documents to third parties will be at the sole risk of the third party and without liability or legal exposure to Consultant.

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13. Any use of or reliance on the work product shall constitute acceptance of the terms hereof.

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Tables

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Table 1
AOC Summary & Investigation Results

Former Meriden Hospital
1 King Place, Meriden, Connecticut

Area of Concern (AOC)	Description / Conceptual Site Model	COCs	Investigations/Sampling Locations	Release Constituents & RSR Exceedances				Release Determination
				Soil ■ Exceedance	Res DEC	I/C DEC	GB PMC	GW Detects & Exceedances	
AOC-1 Northern UST Area (Courtyard)	A 5,000-gallon #2 fuel oil UST was installed in 1982 on the north side of the hospital building and was connected to a back-up generator. The tank was removed in March 1999, at which time, polluted soil was also removed. Confirmatory soil samples were collected and indicated the presence of petroleum hydrocarbons at levels below applicable clean-up criteria. Conflicting information indicated that a 2,000-gallon #2 fuel oil UST was installed in the former tank grave, however, no evidence of a current UST was identified at this location.	VOCs ETPH PAHs Metals	Soil borings: MW-11, SB-16, SB-17 Monitoring wells: MW-11	PAHs ETPH Metals	□ □ □ □ □ □ □ □ □			Barium was detected in GW below applicable criteria. No other COCs detected above laboratory reporting limits in GW.	Concentrations of ETPH, below applicable criteria, were reported at depths of approximately 3 and 7 feet below grade. These concentrations are likely attributable to the historical petroleum impacts identified during the 1999 UST removal. Varying concentrations of metals were reported in each soil sample, below applicable criteria. Since these concentrations are consistent with other metals concentrations reported across the Site, these are likely related to fill material and not indicative of a release. Considering the low level ETPH detections, and no impacts were identified to groundwater, additional investigation or remediation is not warranted in this area.
AOC-2 Southern UST Area (South of Boiler Room)	A 20,000-gallon #6 fuel oil UST was installed in 1968 on the south side of the hospital building adjacent to the boiler room. Later, in 1982, a 2,000-gallon #2 fuel oil UST was installed in this area and connected to a back-up generator, located adjacent to the boiler room inside the Site building. In 1990, the 20,000-gallon UST was reportedly replaced with a 15,000-gallon #6 fuel oil UST; however no documentation of tank closure or sampling was identified. Releases of no. 6 fuel-oil were reported in this area in 1997 and 1998, during tank filling operations. In April 2015, the CT DEEP issued NOV UST-GB15-0067 for a tank beyond its life expectancy and for the UST registration not being up to date. In June 2016, the City of Meriden submitted a response letter documenting their intent to select a developer for the Site (through an RFP process) and ultimately remove the USTs as part of Site remedial actions.	ETPH PAHs Metals	Soil borings: SB-10, SB-11, MW-12, MW-13, SB-23, SB-24, SB-25, SB-26, SB-27 Monitoring wells: MW-12, MW-13	PAHs ETPH Metals	□ □ □ □ □ □ □ □ □			Barium was detected in GW below applicable criteria. No other COCs detected above laboratory reporting limits in GW.	Varying concentrations of metals were reported in soil samples and trace PAHs were reported in one soil sample collected from the southern UST area located south of the boiler room. These detections, below RSR criteria are not indicative of a significant petroleum release. However, it is noted that samples were not collected from beneath the USTs. The USTs have exceeded their life expectancy and will be removed to satisfy NOVUST-GB15-0067. Upon removal, confirmatory soil samples will be collected from below the tanks to confirm a release did not occur. An updated UST registration form will also be completed and submitted to the DEEP.

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				Soil ■ Exceedance	Res DEC	I/C DEC	GB PMC	GW Detects & Exceedances	
AOC-3 Dry Well (adjacent to Southern UST Area)	A drywell was observed south of the boiler room within the southern UST area. A soil boring was advanced adjacent to the drywell as part of the Phase II/Limited Phase III ESA.	ETPH PAHs PCBs Metals	Soil borings: SB-12, SB-23, SB-25	PAHs ETPH Metals	■ ■ □	■ □ □	□ □ □	N/A	A shallow soil sample collected from approximately 2 fbg had concentrations of ETPH and PAHs exceeding applicable RSR criteria. These concentrations could be indicative of a petroleum release to the adjacent drywell. Impacted soil will be excavated during UST removal activities from the adjacent AOC.
AOC-4 Interior Transformers/PCB Equipment	The findings from the 2014 Phase I ESA and Phase II ESA Site visits identified several areas within the building interior which contained transformers and other potentially PCB-containing electrical equipment. While these areas were primarily located in the basement of the Site building, transformer rooms were also noted in select areas of the upper floors of the building.	PCBs ETPH	Concrete Chip Samples: CC-01, CC-06, CC-07, CC-09, CC-14	N/A	N/A		N/A	Concrete chip samples were collected from accessible locations within these areas inside the Site building. PCBs were reported in one concrete chip sample (CC-09) at a concentration that was below 1 mg/kg. ETPH was detected at an elevated concentration (28,000 mg/kg) in CC-14. Low level concentrations of ETPH were also reported in CC-07 and CC-09. The area of the concrete floor with elevated petroleum concentrations indicates a surficial petroleum release to the floor and this portion of the floor will be cleaned or sawcut and removed as part of the Site remedial efforts.
AOC-5 Loading Dock	Based on the past use of the Site and known shipments of hazardous wastes, the potential exists for a release to have occurred in the loading dock area. Additionally, a 1997 spill report from the fuel oil release indicates that no. 6 fuel oil may have migrated to a catch basin in the loading dock area.	VOCs ETPH PAHs PCBs Metals	Concrete Chip Samples: CC-04 (interior) Soil borings: SB-14	None	None		N/A	A shallow soil sample (0.5-1.5 fbg) had varying concentrations of metals reported at levels that were below the applicable RSR criteria. These concentrations are consistent with other metals concentrations reported across the Site, and are likely related to fill material and not indicative of a release. ETPH, PAHs and VOCs were not detected above laboratory reporting limits. No additional investigation or remediation is warranted in this AOC.

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				Soil ■ Exceedance	Res DEC / I/C DEC / GB PMC	GW Detects & Exceedances	
AOC-6 Various Floor Drains & Sumps	Various floor drains and sumps were observed in select accessible areas throughout the building; specifically within the former laundry area and areas within the southern portion of the building near the boiler room. The discharge location of these drains is unknown. As part of Phase II/Limited Phase III investigations, a dye test was conducted on two accessible floor drains, located in the generator room north of the boiler room and in the laundry room area in the southwestern portion of the Site building.	VOCs ETPH PAHs	Investigation: Dye Test	N/A	N/A	N/A	The results of the dye test remained inconclusive, as no evidence of the dye was visually observed in any of the potential discharge locations monitored (including the drywell outside the boiler room, catch basins along Bronson Avenue and sewer manhole covers located within the loading dock). Due to the length of time that the building has been vacant and the evidence of interior flooding observed, it is likely that the floor drain systems are clogged with inert material and the dye may not have made it through the length of the drain systems. The contents and discharge locations of the floor drain systems should be further evaluated as areas of the building become accessible.
AOC-7 Boiler Room	Several leaking containers were observed within the boiler room within the southern portion of the Site building. The fuel lines from the exterior USTs were observed to be damaged where they entered the building which resulted in a significant release of oil to the interior floor surface.	VOCs ETPH PAHs PCBs Metals	Concrete Chip Samples: CC-05 Soil borings: SB-15, SB-20, SB-21 (interior) MW-13, SB-25 & SB-26 (exterior) Monitoring Well: MW-13 (exterior)	VOCs ETPH PAHs PCBs Metals	□ □ □ □ □ □ □ □ ■ ■ ■ □ □ □ □	Barium was detected in GW below applicable criteria. No other COCs detected above laboratory reporting limits in GW.	An elevated concentration of PCBs (180 mg/kg) was reported in shallow soil collected from beneath the concrete slab at the interior soil boring SB-15. Various PAHs were also detected above RSR criteria in this sample. Low level concentrations of Metals, ETPH and select VOCs (including 1,2,4-trimethylbenzene and naphthalene) were also reported. PCBs were not detected in the concrete chip sample or in the deeper soil sample collected from 3-5 fbg at SB-15. PAHs were detected at varying concentrations, below RSR criteria in the sample collected from MW-13, installed exterior of the eastern wall of the boiler room. PCBs and PAHs were not detected in soil samples collected from surrounding borings SB-20, SB-21, SB-25 or SB-26. Remediation of the localized area of PCB-impacted soil through excavation and disposal as a PCB remediation waste is warranted within the boiler room interior.

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				Soil ■ Exceedance	Res DEC I/C DEC GB PMC	GW Detects & Exceedances	
AOC-8 Former Incinerators (2)	A review of historical Site plans identified at least two former incinerators. The first (presumably the original) was located north of the boiler room in a small area north of the current generator room, west of the former boiler room. The second incinerator was located in a standalone structure located to the east of the loading dock. This incinerator building was likely constructed to replace the former incinerator during an iteration of building renovations.	VOCs ETPH PAHs Metals	Concrete Chip Samples: CC-15 (interior) Soil boring/Monitoring Well: MW-10	None	None	Barium was detected in GW below applicable criteria. No other COCs detected above laboratory reporting limits in GW.	Varying concentrations of metals were reported in shallow soil and within the concrete chip sample from these areas, at levels that were below applicable criteria. Based on these results, the metals concentrations in soil are likely related to fill material and not indicative of a release from this AOC. No further investigation/remediation warranted.
AOC-9 Smoke Stack	A large smoke stack related to the former incinerators is located south of the boiler room in the southern UST area. Residual ash and material was observed within the stack.	VOCs SVOCs ETPH PCBs Metals	Residual Ash/Sediment Sample	N/A	N/A	N/A	The sample of residual ash/sediment from within the smoke stack had varying concentrations of total and TCLP metals and SVOCs reported at levels below the EPA's maximum concentrations. Based on these results, the material from within the stack can be removed and disposed as non-hazardous waste.
AOC-10 Interior Oil Trenches (Laundry Area)	A review of historical Site floor plans indicated a sub-slab "oil trench" was located within the laundry area in the southwestern portion of the building. According to the floor plans, this trench connected the laundry dryer units along the western side of the laundry area and potentially extended further east to other interior areas.	ETPH PAHs PCBs	Concrete Chip Sample: CC-13 (interior) Soil borings: SB-18, SB-19 (interior)	None	None	N/A	ETPH was detected at a concentration of 2,900 mg/kg (above the Res DEC) in CC-13; however COCs were not detected above laboratory reporting limits in shallow soil collected beneath the concrete slab. Although no release was identified in the portions of the oil trenches investigated, further investigation/remediation may be warranted should Site development activities expose additional lengths of the oil trenches within this portion of the building.
AOC-11 Chemical Storage Room (Laundry Area)	A review of historical Site floor plans indicated a chemical storage room was located within the laundry area in the southwestern portion of the building. The specific chemicals and quantities previously stored in this area, however, are unknown.	Metals	Concrete Chip Sample: CC-12 (interior)	N/A	N/A	N/A	Concentrations of metals (including arsenic, barium, cadmium, chromium, lead, mercury and silver) reported in concrete at levels below the Res DEC. No further investigation/remediation warranted.

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				Soil ■ Exceedance	Res DEC / I/C DEC / GB PMC	GW Detects & Exceedances	
AOC-12 Elevator Rooms	The locations of several elevator rooms were identified during a review of historical site plans. These rooms are enclosed areas in which the mechanics of the elevators, including oil reservoirs are located.	ETPH PCBs	Concrete Chip Samples: CC-08, CC-19, CC-21 (interior)	N/A	N/A	N/A	PCBs were reported in all three concrete chip samples (collected from accessible locations within the building) at concentrations varying from 0.99 to 3.9 mg/kg with the highest concentration in CC-21 located in the first floor of the northwest portion of the building. ETPH was detected at an elevated concentration (16,000 mg/kg) in CC-21, where staining was observed, and at 510 mg/kg in CC-19. Releases of PCBs >1ppm in concrete will be remediated through cleaning of the floor or removal of the impacted area of concrete.
AOC-13 Switchgear/Generator Room (near courtyard)	A backup generator/electrical switchgear room was identified adjacent to the northern courtyard. Access to this room is from the courtyard area only and therefore this area was not previously identified as an REC in the 2014 Phase I ESA.	ETPH PCBs PAHs	Concrete Chip Sample: CC-16 (interior) Soil boring: SB-32, SB-33 (interior)	None	None	N/A	COCs were not detected above laboratory reporting limits in soil. ETPH was detected in the concrete chip sample at a concentration below the Res DEC. PCBs were not detected above laboratory reporting limits in the concrete chip sample.
AOC-14 Urban Fill Material	As with any parcel, located in an urbanized area where former structures have been razed, the potential exists for the presence of urban fill containing ash, coal, asphalt fragments, and demolition debris. Often urban fill materials are found to contain petroleum products and heavy metals due to the presence of ash, asphalt and coal fragments. Varying thicknesses of fill containing ash, coal fragments and building debris were identified across the Site.	ETPH PAHs Metals	Soil borings: SB-13, SB-28, SB-29, SB-30, SB-31, MW-13 Monitoring Well: MW-13	Arsenic Copper Lead	■ ■ □ ■ □ □ ■ ■ □	Barium was detected in GW below applicable criteria. No other COCs detected above laboratory reporting limits in GW.	Varying concentrations of total metals were detected in soil samples collected from fill intervals. Arsenic, copper and lead exceeded the Res and/or I/C DEC in samples collected west of King Place.

Notes:

AOC = Area of Concern
COC = Constituents of Concern
DEC = Direct Exposure Criteria
PMC = Pollutant Mobility Criteria
UST = Underground Storage Tank
TCLP = Toxicity Characteristic Leaching Procedure
EPA = Environmental Protection Agency

VOCs = volatile organic compounds
ETPH = extractable total petroleum hydrocarbons
PAHs = polycyclic aromatic hydrocarbons
PCBs = polychlorinated biphenyls
RCRA 8 Metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver)

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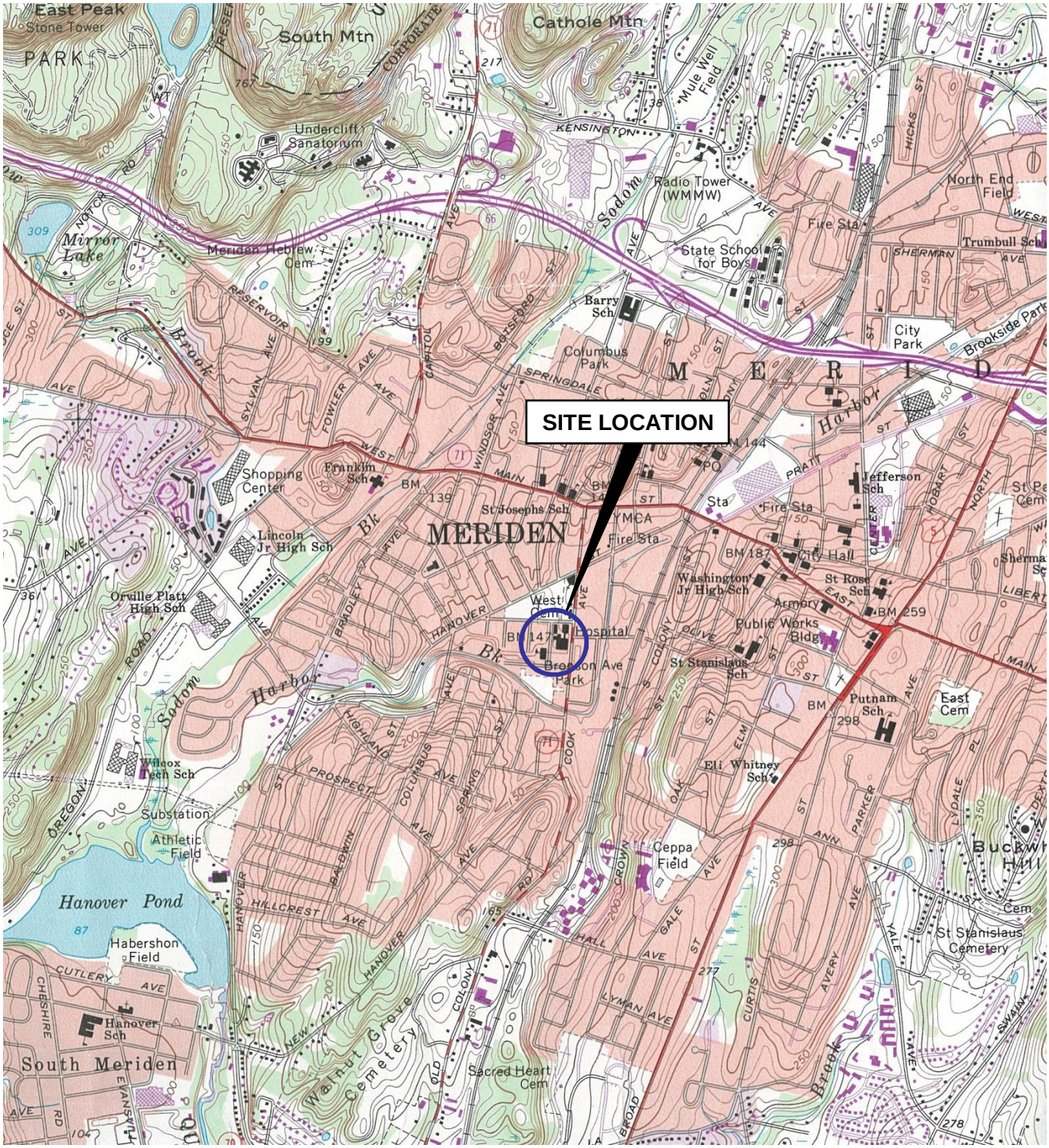
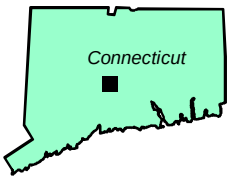
Figures



MAP REFERENCE:
THIS MAP WAS PREPARED FROM THE FOLLOWING
7.5 MINUTE SERIES TOPOGRAPHIC MAP:
MERIDEN, CONN. 1967 PHOTOREVISED 1992



Quadrangle Location

0 1000 2000
GRAPHIC SCALE

SCALE: 1"=2000'

www.FandO.com

FUSS & O'NEILL

146 HARTFORD RD MANCHESTER, CT 06004 860.646.2469

SITE LOCATION MAP
FORMER MERIDEN HOSPITAL

1 KING PLACE MERIDEN, CONNECTICUT

PROJ. No: 20120232.C60
DATE: JUNE 2017

FIGURE 1

20120232\C60\Remedial Action Report\Figures\Figure 1-Site Location Map.PPT

Notes:
Aerial & property boundaries obtained from City of Meriden GIS database

All locations are approximate

SCALE: Not to Scale

FUSS & O'NEILL
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SITE PLAN

FORMER MERIDEN HOSPITAL

1 KING PLACE MERIDEN, CONNECTICUT

PROJ. No: 20120232.C60
DATE: JUNE 2017

FIGURE 2

20120232\C60\Remedial Action Report\Figures\Figure 2-Site Plan.PPT

LAYOUT LEGEND

MW-10	MONITORING WELL LOCATION
MW-02	EXISTING MONITORING WELL LOCATION
SB-01	SOIL BORING SAMPLE LOCATION
CC-15	CONCRETE CHIP SAMPLE LOCATION
SS-01	SOIL GRAB SAMPLE LOCATION (FROM SMOKE STACK CLEAN OUT)
G-01	WATER GRAB SAMPLE LOCATION (FROM STANDING WATER IN TUNNEL)
	DRY WELL / INTERIOR DRAIN
	CATCH BASIN

GENERAL NOTES

1. SYMBOLS AND LEGENDS OF PROJECT FEATURES ARE GRAPHIC REPRESENTATIONS AND ARE NOT NECESSARILY SHOWN ON THE DRAWINGS TO SCALE OR TO THEIR ACTUAL DIMENSION OR LOCATION.
2. DO NOT RELY SOLELY ON ELECTRONIC VERSIONS OF DRAWINGS, SPECIFICATIONS, AND DATA FILES THAT ARE PROVIDED BY THE ENGINEER. FIELD VERIFY LOCATION OF PROJECT FEATURES.
3. BASE PLAN: THE BUILDING FEATURES WERE OBTAINED FROM A FRID, FERGUSON, MAHAFFEY & PERRY ARCHITECTS PLAN DATED 1-7-1982. INTERIOR AND EXTERIOR FEATURES ARE APPROXIMATE AS NO CURRENT SITE PLAN COULD BE FOUND.
4. MONITORING WELL MEASURING POINT ELEVATIONS ARE BASED NGVD 29.
5. BORING LOCATIONS AND MEASURING POINT ELEVATIONS WERE OBTAINED FROM FUSS & O'NEILL PERSONNEL DURING MARCH 2016 – MAY 2016.

5	NOT USED		
6	MAN HOLE	107.07	96.37
7	EX MAN HOLE	101.85 EX*	92.72
8	CATCH BASIN	96.5	–
9	EX. MAN HOLE	–	92.17
10	CATCH BASIN	107.00'	
11	TRENCH DRAIN	108.77	
12	CATCH BASIN	108.0	

SEWER MAN HOLES
OIL UTILITY TRENCH (FIRST FLOOR)
LAUNDRY ROOM AREA
ELECTRICAL EQUIPMENT ROOM (SECOND FLOOR)
ELEVATOR EQUIPMENT ROOM
TRANSFORMER LOCATION (SECOND FLOOR ABOVE LAUNDRY AREA)
CHEMICAL STORAGE ROOM (FIRST FLOOR)
HISTORICAL INCINERATOR ROOM
BOILER ROOM
LOADING DOCK
TRANSFORMER LOCATIONS (FIRST FLOOR)
GROUNDWATER FLOW
DRY WELL
MECHANICAL EQUIPMENT ROOM (SECOND FLOOR)
TRANSFORMER ROOM (FIRST FLOOR)
FORMER INCINERATOR BUILDING
ELEVATOR EQUIPMENT ROOM (SECOND FLOOR)
EQUIPMENT ROOM (BASEMENT/TUNNEL)
NORTHERN COURTYARD UST
SOUTHERN UST AREA
SUMP
SMOKE STACK
APPROXIMATE AREA OF FORMER BUILDINGS
DRY WELL (FIRST FLOOR)
GENERATOR ROOM (FIRST FLOOR)
ELEVATOR EQUIPMENT ROOM (FIRST FLOOR)
KING PLACE
ORANGE STREET
BRONSON AVENUE
COOK AVENUE
1968 BUILDING
1943 BUILDING
1923 BUILDING
HOSPITAL ANNEX

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
1.			XX/XX	XX

SCALE:
HORZ.: 1" = 30'
VERT.:
DATUM:
HORZ.: NAD 87
VERT.: NGVD 29
0 15 30
GRAPHIC SCALE

FUSS & O'NEILL
146 HARTFORD ROAD
MANCHESTER, CONNECTICUT 06040
860.646.2469
www.fando.com

CITY OF MERIDEN

SITE BUILDING & SAMPLING LOCATIONS

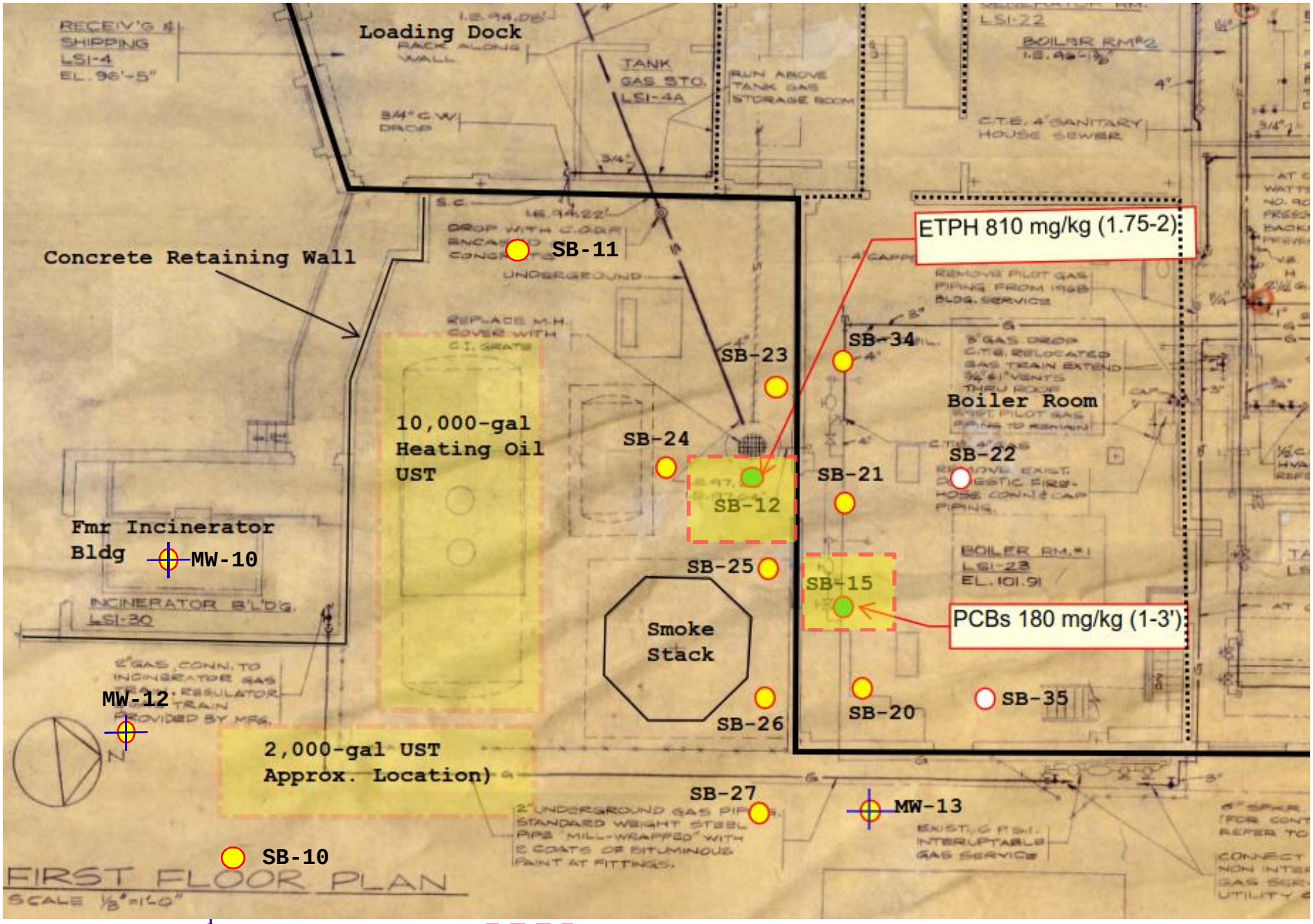
FORMER MERIDEN HOSPITAL
1 KING PLACE

MERIDEN CONNECTICUT

PROJ. No.: 20120232.C60
DATE: JUNE 2017

FIGURE 3

File Path: J:\DWG\P2012\0232\C60\Environmental\Plan\20120232C60_STP01.dwg Layout: FIG 2 STP Plotted: Fri, June 02, 2017 - 1:04 PM User: srochelt
MS VIEW: LAYER STATE:
Plotter: DWG TO PDF.PC3 CTB File: FO.STB



Boring (F&O 2016) Monitoring Well (F&O 2016) Approximate Proposed Remedial Excavation Areas

Notes:
Basemap Image obtained from Former Meriden Hospital Floor Plan (undated)
All locations are approximate

SCALE: Not to Scale

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BOILER ROOM / SOUTHERN UST AREA
FORMER MERIDEN HOSPITAL
1 KING PLACE MERIDEN, CONNECTICUT

PROJ. No: 20120232.C60
DATE: JUNE 2017

FIGURE 4

20120232\C60\Remedial Action Report\Figures\Figure 4-Boiler Room_Southern UST Area.PPT

FUSS & O'NEILL

Appendix A

Request for Approval of Criteria for Additional Polluting Substances

Department of Energy & Environmental Protection
Bureau of Water Protection and Land Reuse
Remediation Division
79 Elm Street, Hartford, CT 06106-5127
(860) 424-3705 **www.ct.gov/deep/remediation**

DEEP USE ONLY (Date Stamp)

REQUEST FOR APPROVAL OF CRITERIA FOR ADDITIONAL POLLUTING SUBSTANCES AND CERTAIN ALTERNATIVE CRITERIA

In accordance with Sections 22a-133k-1 through k-3 of the Regulations of Connecticut State Agencies

This form is prescribed by the Commissioner and must be completed when requesting the Commissioner's approval to use site-specific cleanup criteria for Additional Polluting Substances and certain Alternative Criteria. For use of the criteria listed below for the site identified in this form, the Commissioner's approval is required pursuant to the Remediation Standard Regulations, Sections 22a-133k-1 through 22a-133k-3 (RSRs) of the Regulations of Connecticut State Agencies (RCSA).

If this request is for an anticipated Property Transfer Act Form I, II, or IV filing, the approval will be conditional on the submittal of such filing within one year of the date of this approval. After such time, if such filing was not submitted, this approval automatically expires.

In all other cases, the approval expires eight years from the date approved unless otherwise extended by the Commissioner in writing, or unless a Verification, Interim Verification, or Final Remedial Action Report (in the case of DEEP-lead or Voluntary Remediation under CGS Section 22a-133y only) is submitted within said timeframe.

All sections of this form must be completed, as applicable.

Check the box to indicate the program for which this form is being submitted:

☐ Connecticut General Statutes (CGS) section 22a-134a(a)-(e), Property Transfer Program
☐ CGS section 22a-133x, Voluntary Remediation Program
☐ CGS section 22a-133y, Voluntary Remediation Program
☒ Other (specify) TBD

Site Identification

RemID# 0

Name of Site: Former Meriden Hospital
Street Address: 1 King Place
City/Town: Meriden State: CT Zip Code: 6450-
Groundwater Classification: GB

Contact Information

Certifying Party (if Property Transfer): ☒ N/A
Person submitting Request: Stefanie K. Wierszchalek Title: Hydrogeologist
Business Name: Fuss & O'Neill, Inc. E-mail Address: SWierszchalek@fando.com
Mailing Address: 146 Hartford Road
City/Town: Manchester State: CT Zip Code: 06040-
Business Phone: 860-646-2469 Ext. 5503 Fax: - -

☐ Request to use the 2003 Draft Volatilization and Soil Vapor Criteria Tables C2 and C3, as revised in 2015.

"I hereby request approval, in accordance with Sections 22a-133k-2(b)(5), 22a-133k-2(c)(6), 22a-133k-3(h), 22a-133k-3(b)(3)(B), and/or 22a-133k-3(c)(4)(B) of the RCSA, to use the criteria selected in the table below for Additional Polluting Substances at the site identified above."

Check the box indicating the criteria for which approval is requested. Selection of criteria must correspond to the groundwater classification of the site. The criteria below are not valid and effective for any release or property until and unless DEEP issues a written approval for use at a specific property. DEEP may update these criteria at any time, so no one should rely on them until receipt from DEEP of a property-specific approval. These criteria are optional and any person may elect to apply for a different criterion for any additional polluting substance provided that adequate documentation to support such request is submitted to DEEP.

Substance	Res DEC (mg/kg)	I/C DEC (mg/kg)	GA PMC (mg/kg)	GB PMC (mg/kg)	RSVVC (ppmv)[1]	I/CSVVC (ppmv)[1]	RSVVC (mg/m^3)[1]	I/CSVVC (mg/m^3)[1]	GWPC (µg/L)	SWPC (µg/L)[1]	RGWVC (µg/L)[1]	I/CGWVC (µg/L)[1]
Acenaphthene	1,000 ☒	2,500 ☐	8.4 ☐	84 ☒	13 ☐	110 ☐	83 ☐	690 ☐	420 ☐	150 ☒	30,500 ☒	50,000 ☐
Acetone										10,000 ☐		
Acetonitrile	340 ☐	1,000 ☐	0.70 ☐	7.0 ☐	14 ☐	140 ☐	24 ☐	240 ☐	35 ☐	10,000 ☐	37,100 ☐	50,000 ☐
Acrolein	34 ☐	1,000 ☐	0.20 ☐	2.0 ☐	0.003 ☐	0.035 ☐	0.008 ☐	0.081 ☐	10 ☐	30 ☐	4.0 ☐	50 ☐
Alachor										450 ☐		
Aldicarb										9.4 ☐		
Aldrin	0.04 ☐	0.34 ☐	0.002 ☐	0.01 ☐					0.05 ☐	0.05 ☐		
Aniline	110 ☐	1,000 ☐	0.20 ☐	1.2 ☐					6.1 ☐	41 ☐		
Atrazine										16 ☐		
Benzidine	0.20 ☐	0.20 ☐	0.20 ☐	1.0 ☐					5.0 ☐	5.0 ☐		
Benzo(g,h,i)perylene	8.4 ☒	78 ☐	1 ☐	1 ☒					0.48 ☐	150 ☒		
Benzoic acid	1,000 ☐	2,500 ☐	20 ☐	200 ☐					1,000 ☐	9,000 ☐		
Bis(2-chloroethoxy)methane	200 ☐	2,500 ☐	0.42 ☐	4.2 ☐					21 ☐	10,000 ☐		
Bromodichloromethane	18 ☐	170 ☐	0.02 ☐	0.21 ☐	0.002 ☐	0.046 ☐	0.012 ☐	0.31 ☐	1.0 ☐	510 ☐	1.1 ☐	35 ☐
Bromomethane	34 ☐	1,000 ☐	0.07 ☐	0.70 ☐	0.51 ☐	5.2 ☐	2 ☐	20 ☐	3.5 ☐	160 ☐	83 ☐	1,100 ☐
2-Butanone (MEK)										10,000 ☐		
Butylbenzene, n-	500 ☐	1,000 ☐	7.0 ☐	70 ☐	13 ☐	130 ☐	69 ☐	690 ☐	350 ☐	10,000 ☐	1,600 ☐	21,800 ☐
Butylbenzene, sec-	500 ☐	1,000 ☐	7.0 ☐	70 ☐	13 ☐	130 ☐	69 ☐	690 ☐	350 ☐	10,000 ☐	1,500 ☐	20,100 ☐
Butylbenzene, tert-	500 ☐	1,000 ☐	7.0 ☐	70 ☐	13 ☐	130 ☐	69 ☐	690 ☐	350 ☐	10,000 ☐	1,900 ☐	25,300 ☐

Substance	Res DEC (mg/kg)	I/C DEC (mg/kg)	GA PMC (mg/kg)	GB PMC (mg/kg)	RSVVC (ppmv)[1]	I/CSVVC (ppmv)[1]	RSVVC (mg/m^3)[1]	I/CSVVC (mg/m^3)[1]	GWPC (µg/L)	SWPC (µg/L)[1]	RGWVC (µg/L)[1]	I/CGWVC (µg/L)[1]
Butylbenzyl phthlate										230 ☐		
Carbazole	31 ☐	290 ☐	0.20 ☐	1.0 ☐					5.0 ☐	53 ☐		
Carbon disulfide	500 ☐	1,000 ☐	0.80 ☐	8.0 ☐	27 ☐	48 ☐	83 ☐	150 ☐	40 ☐	150 ☐	2,100 ☐	5,200 ☐
Chlorodane, (total)[2]	0.49 ☐	2.2 ☐	0.066 ☐	0.066 ☐					0.30 ☐	0.3 ☐		
Chloroaniline, 4-	3.1 ☐	29 ☐	0.20 ☐	1.0 ☐					5.0 ☐	9.9 ☐		
Chloroethane	130 ☐	1,000 ☐	0.15 ☐	1.5 ☐	0.27 ☐	3.3 ☐	0.71 ☐	8.7 ☐	7.4 ☐	10,000 ☐	22 ☐	360 ☐
Chloromethane	180 ☐	1,000 ☐	0.36 ☐	3.6 ☐	1.70 ☐	18 ☐	3.6 ☐	36 ☐	18 ☐	10,000 ☐	130 ☐	1,800 ☐
Chloronaphthalene, 2-	500 ☐	1,000 ☐	11 ☐	110 ☐	17 ☐	100 ☐	110 ☐	690 ☐	560 ☐	10,000 ☐	27,300 ☐	50,000 ☐
Chlorophenol, 3-methyl-4	1,000 ☐	2,500 ☐	14 ☐	140 ☐					700 ☐	73 ☐		
Chlorophenol, 2-										420 ☐		
Chlorotoluene, 2-	500 ☐	1,000 ☐	2.8 ☐	28 ☐	6.1 ☐	62 ☐	32 ☐	320 ☐	140 ☐	10,000 ☐	2,100 ☐	28,300 ☐
Chlorotoluene, 4-	500 ☐	1,000 ☐	2.8 ☐	28 ☐	6.1 ☐	62 ☐	32 ☐	320 ☐	140 ☐	10,000 ☐	1,900 ☐	25,200 ☐
Chrysene	84 ☒	780 ☐	1 ☐	1 ☒					4.8 ☐	0.54 ☒		
Cyclohexane	500 ☐	1,000 ☐	20 ☐	200 ☐	110 ☐	200 ☐	380 ☐	690 ☐	1,000 ☐	2,800 ☐	1,100 ☐	2,800 ☐
D, 2,4-										1,700 ☐		
Dibenzo(a,h)anthracene	1.0 ☐	1 ☐	1 ☐	1 ☐					0.10 ☐	0.30 ☐		
Dibenzofuran	68 ☐	1,000 ☐	0.20 ☐	1.4 ☐	0.20 ☐	2.1 ☐	1.4 ☐	14 ☐	7.0 ☐	40 ☐	460 ☐	5,800 ☐
Dibromo-3-chloropropane, 1.2-	0.09 ☐	0.82 ☐	0.005 ☐	0.04 ☐					0.20 ☐	1.1 ☐		
Dicamba	500 ☐	1,000 ☐	4.2 ☐	42 ☐					210 ☐	2,200 ☐		
Dichlorobenzidine, 3,3'-	1.4 ☐	13 ☐	0.20 ☐	1.0 ☐					5.0 ☐	5.0 ☐		
Dichlorobutene, 1,4-					0.0005 ☐	0.0005 ☐	0.0026 ☐	0.0027 ☐			0.5 ☐	0.5 ☐
Dichlorodifluromethane	500 ☐	1,000 ☐	7.0 ☐	70 ☐	8.0 ☐	81 ☐	39 ☐	400 ☐	350 ☐	10,000 ☐	53 ☐	720 ☐
Dichlorodiphenyl Trichloroethane, P,P'-(DDT) (total)[3]	1.8 ☐	17 ☐	0.003 ☐	0.02 ☐					0.10 ☐	0.05 ☐		

Substance	Res DEC (mg/kg)	I/C DEC (mg/kg)	GA PMC (mg/kg)	GB PMC (mg/kg)	RSVVC (ppmv)[1]	I/CSVVC (ppmv)[1]	RSVVC (mg/m^3)[1]	I/CSVVC (mg/m^3)[1]	GWPC (µg/L)	SWPC (µg/L)[1]	RGWVC (µg/L)[1]	I/CGWVC (µg/L)[1]
Dichloroethane, 1,1-										4,100 ☐		
Dichloroethene, 1,2-										9,700 ☐		
Dichloroethene, cis 1,2-										6,200 ☐		
Dichloroethene, trans 1,2-										10,000 ☐		
Dichloroprop	240 ☐	1,000 ☐	0.50 ☐	5.0 ☐					25 ☐	120 ☐		
Dichloropropane, 1,2										150 ☐		
Diethyl phthalate	1,000 ☐	2,500 ☐	20 ☐	200 ☐					1,000 ☐	2,200 ☐		
Dimethyl phthalate	1,000 ☐	2,500 ☐	20 ☐	200 ☐					1,000 ☐	10,000 ☐		
Dimethylphenol, 2,4-	1,000 ☐	2,500 ☐	2.8 ☐	28 ☐					140 ☐	150 ☐		
Dinitrophenol, 2,4-	140 ☐	2,500 ☐	0.30 ☐	2.8 ☐					14 ☐	710 ☐		
Dinitophenol, 2-methyl-4,6-	20 ☐	610 ☐	0.30 ☐	2.0 ☐					10 ☐	10 ☐		
Dinitrotoluene, 2,4-	0.90 ☐	8.4 ☐	0.20 ☐	1.0 ☐					5.0 ☐	100 ☐		
Dinitrotoluene, 2,6-	0.9 ☐	8.4 ☐	0.2 ☐	1.0 ☐					5.0 ☐	46 ☐		
Dioxane, 1,4-	6.1 ☐	57 ☐	0.10 ☐	0.60 ☐	0.050 ☐	0.61 ☐	0.18 ☐	2.2 ☐	3.0 ☐	960 ☐		
1,2-Diphenylhydrazine	0.77 ☐	7.2 ☐	0.20 ☐	1.0 ☐					5.0 ☐	6.0 ☐		
Endosulfan (total)[4]	41 ☐	1,000 ☐	0.084 ☐	0.84 ☐					4.2 ☐	0.56 ☐		
Endrin (total)[5]	20 ☐	610 ☐	0.04 ☐	0.40 ☐					2.0 ☐	0.1 ☐		
Ethanol	1,000 ☐	2,500 ☐	20 ☐	200 ☐					1,000 ☐	10,000 ☐		
Ethyl acetate	500 ☐	1,000 ☐	20 ☐	200 ☐	100 ☐	190 ☐	380 ☐	690 ☐	1,000 ☐	10,000 ☐	50,000 ☐	50,000 ☐
Ethylene glycol	1,000 ☐	2,500 ☐	20 ☐	200 ☐					1,000 ☐	10,000 ☐		
Extractable Total Petroleum Hydrocarbons (ETPH)										250 ☐		
Formaldehyde	1,000 ☐	2,500 ☐	2.8 ☐	28 ☐					140 ☐	9,700 ☐		
Hexachlorobutadiene	130 ☐	1,200 ☐	0.2 ☐	1.5 ☐					7.4 ☐	10 ☐		

Substance	Res DEC (mg/kg)	I/C DEC (mg/kg)	GA PMC (mg/kg)	GB PMC (mg/kg)	RSVVC (ppmv)[1]	I/CSVVC (ppmv)[1]	RSVVC (mg/m^3)[1]	I/CSVVC (mg/m^3)[1]	GWPC (µg/L)	SWPC (µg/L)[1]	RGWVC (µg/L)[1]	I/CGWVC (µg/L)[1]
Hexachlorocyclohexane, alpha-	0.34 ☐	3.2 ☐	0.002 ☐	0.01 ☐					0.05 ☐	0.11 ☐		
Hexachlorocyclohexane, beta-	0.34 ☐	3.2 ☐	0.002 ☐	0.01 ☐					0.05 ☐	0.11 ☐		
Hexachlorocyclohexane, delta-	0.34 ☐	3.2 ☐	0.002 ☐	0.01 ☐					0.05 ☐	0.11 ☐		
Hexachlorocyclopentadiene	410 ☐	1,000 ☐	0.84 ☐	8.4 ☐					42 ☐	0.70 ☐		
Hexane, n-	500 ☐	1,000 ☐	8.4 ☐	84 ☐	79 ☐	200 ☐	280 ☐	690 ☐	420 ☐	200 ☐	71 ☐	240 ☐
Hexanone-2	340 ☐	1,000 ☐	0.70 ☐	7.0 ☐	2.90 ☐	29 ☐	12 ☐	120 ☐	35 ☐	10,000 ☐	7,600 ☐	94,000 ☐
Indeno(1,2,3-c,d)pyrene	1.0 ☒	7.8 ☐	1 ☐	1 ☒					0.10 ☐	0.54 ☒		
Isophorone	640 ☐	2,500 ☐	0.74 ☐	7.4 ☐					37 ☐	9,200 ☐		
Isopropanol	1,000 ☐	2,500 ☐	46 ☐	460 ☐					2,300 ☐	10,000 ☐		
Isopropylbenzene (cumene)	500 ☐	1,000 ☐	0.50 ☐	5.0 ☐	6.0 ☐	11 ☐	30 ☐	54 ☐	25 ☐	210 ☐	900 ☐	2,200 ☐
Isopropyltoluene, 4- (cymene)	500 ☐	1,000 ☐	0.50 ☐	5.0 ☐	5.3 ☐	9.7 ☐	30 ☐	54 ☐	25 ☐	200 ☐	870 ☐	2,100 ☐
Lindane										0.11 ☐		
Methanol	1,000 ☐	2,500 ☐	20 ☐	200 ☐					1,000 ☐	3,300 ☐		
Methoxychlor										0.50 ☐		
Methyl methacrylate	500 ☐	1,000 ☐	20 ☐	200 ☐	6.8 ☐	68 ☐	28 ☐	280 ☐	980 ☐	10,000 ☐	6,800 ☐	87,600 ☐
Methylnaphthalene, 1-	21 ☐	200 ☐	0.20 ☐	1.0 ☐	0.019 ☐	0.24 ☐	0.11 ☐	1.4 ☐	5 ☐	61 ☐	20 ☐	320 ☐
Methylnaphthalene, 2-	270 ☒	1,000 ☐	0.56 ☐	5.6 ☒	0.95 ☐	9.7 ☐	5.5 ☐	57 ☐	28 ☐	62 ☒	1,000 ☒	13,100 ☐
Methylphenol, 2- (Cresol, o-)	1,000 ☐	2,500 ☐	2.8 ☐	28 ☐					140 ☐	670 ☐		
Methylphenol, 3- (Cresol, m-)	1,000 ☐	2,500 ☐	2.4 ☐	24 ☐					120 ☐	620 ☐		
Methylphenol, 4- (Cresol, p-)	1,000 ☐	2,500 ☐	2.8 ☐	28 ☐					140 ☐	560 ☐		
Methyl-tert butyl ether (MTBE)										10,000 ☐		
Naphthalene										210 ☐		
Nitroaniline, 2-	31 ☐	290 ☐	0.30 ☐	2.0 ☐					10 ☐	210 ☐		

Substance	Res DEC (mg/kg)	I/C DEC (mg/kg)	GA PMC (mg/kg)	GB PMC (mg/kg)	RSVVC (ppmv)[1]	I/CSVVC (ppmv)[1]	RSVVC (mg/m^3)[1]	I/CSVVC (mg/m^3)[1]	GWPC (µg/L)	SWPC (µg/L)[1]	RGWVC (µg/L)[1]	I/CGWVC (µg/L)[1]
Nitroaniline, 3-	31 ☐	290 ☐	0.30 ☐	2.0 ☐					10 ☐	70 ☐		
Nitroaniline, 4-	31 ☐	290 ☐	0.30 ☐	2.0 ☐					10 ☐	1,200 ☐		
Nitrobenzene	4 ☐	41 ☐	0.20 ☐	1.0 ☐	0.005 ☐	0.056 ☐	0.023 ☐	0.28 ☐	5 ☐	2,300 ☐	51 ☐	750 ☐
Nitrophenol, 2-										560 ☐		
Nitrosodimethylamine, N-	0.20 ☐	0.36 ☐	0.20 ☐	1.0 ☐					5.0 ☐	90 ☐		
Nitrosodi-n-propylamine, N-	0.20 ☐	0.82 ☐	0.20 ☐	1.0 ☐					5.0 ☐	15 ☐		
Nitrosodiphenylamine, N-	130 ☐	1,200 ☐	0.20 ☐	1.4 ☐					7.1 ☐	180 ☐		
Pentachloronitrobenzene	68 ☐	2,000 ☐	0.14 ☐	1.4 ☐					7.0 ☐	25 ☐		
Pentachlorophenol										30 ☐		
Phenanthrene										14 ☐		
Propylbenzene, n-	500 ☐	1,000 ☐	1.0 ☐	10 ☐	7.4 ☐	14 ☐	36 ☐	67 ☐	50 ☐	10,000 ☐	1,200 ☐	2,900 ☐
Propylene glycol	1,000 ☐	2,500 ☐	20 ☐	200 ☐					1,000 ☐	10,000 ☐		
Pyridine	20 ☐	610 ☐	0.20 ☐	1.0 ☐	0.13 ☐	1.3 ☐	0.41 ☐	4.2 ☐	5.0 ☐	260 ☐	1,900 ☐	23,500 ☐
Styrene										320 ☐		
tert Butyl Alcohol (TBA) (Total Oxygenates)[6]	1,000 ☐	2,500 ☐	2.0 ☐	20 ☐					100 ☐	10,000 ☐		
Tetrachlorobenzene, 1,2,4,5-	20 ☐	610 ☐	0.1 ☐	1.0 ☐					5.0 ☐	11 ☐		
Tetrachloroethane, 1,1,1,2-										330 ☐		
Tetrahydrofuran	61 ☐	570 ☐	0.08 ☐	0.80 ☐	0.10 ☐	1.28 ☐	0.31 ☐	3.8 ☐	4 ☐	9,600 ☐	250 ☐	3,700 ☐
Trichloro-1,2,2-trifluoroethane, 1,1,2-	500 ☐	1,000 ☐	20 ☐	200 ☐	50 ☐	90 ☐	380 ☐	690 ☐	1,000 ☐	320 ☐	330 ☐	810 ☐
Trichlorobenzene, 1,2,4-	21 ☐	200 ☐	1.4 ☐	14 ☐	0.015 ☐	0.64 ☐	0.11 ☐	4.7 ☐	70 ☐	9.6 ☐	12 ☐	660 ☐
Trichlorofluoromethane	500 ☐	1,000 ☐	20 ☐	200 ☐	50 ☐	120 ☐	280 ☐	690 ☐	1,000 ☐	10,000 ☐	1,300 ☐	4,300 ☐
Trichlorophenol, 2,4,5-	1,000 ☐	2,500 ☐	14 ☐	140 ☐					700 ☐	28 ☐		
Trichlorophenol, 2,4,6-	56 ☐	520 ☐	0.20 ☐	1.0 ☐					5.0 ☐	49 ☐		

Substance	Res DEC (mg/kg)	I/C DEC (mg/kg)	GA PMC (mg/kg)	GB PMC (mg/kg)	RSVVC (ppmv)[1]	I/CSVVC (ppmv)[1]	RSVVC (mg/m^3)[1]	I/CSVVC (mg/m^3)[1]	GWPC (µg/L)	SWPC (µg/L)[1]	RGWVC (µg/L)[1]	I/CGWVC (µg/L)[1]
Trimethylbenzene, 1,2,4-	500 ☒	1,000 ☐	2.8 ☐	28 ☒	4.0 ☐	41 ☐	20 ☐	200 ☐	140 ☐	150 ☒	940 ☒	12,800 ☐
Trimethylbenzene, 1,3,5-	500 ☐	1,000 ☐	2.8 ☐	28 ☐	4.0 ☐	41 ☐	20 ☐	200 ☐	140 ☐	260 ☐	730 ☐	10,000 ☐
Vinyl acetate	500 ☐	1,000 ☐	8.0 ☐	80 ☐	2.2 ☐	23 ☐	7.9 ☐	81 ☐	400 ☐	10,000 ☐	1,500 ☐	18,900 ☐
Xylenes (total)										270 ☐		

Inorganics	Res DEC (mg/kg)	I/C DEC (mg/kg)	GA PMC (mg/L via SPLP)	GB PMC (mg/L via SPLP)	GWPC (µg/L)	SWPC (µg/L)
Aluminum	50,000 ☐	50,000 ☐	0.05 ☐	0.5 ☐	50 ☐	870 ☐
Ammonia	6,800 ☐	50,000 ☐	0.7 ☐	7.0 ☐	700 ☐	10,000 ☐
Barium						2,200 ☐
Boron	13,500 ☐	50,000 ☐	1.0 ☐	10 ☐	1,000 ☐	10,000 ☐
Chloride						10,000 ☐
Chlorine	6,800 ☐	50,000 ☐	4.0 ☐	40 ☐	4,000 ☐	110 ☐
Cobalt	20 ☐	610 ☐	0.002 ☐	0.02 ☐	2.1 ☐	240 ☐
Iron						10,000 ☐
Lithium	140 ☐	4,100 ☐	0.014 ☐	0.14 ☐	14 ☐	4,400 ☐
Manganese	3,400 ☐	50,000 ☐	0.50 ☐	5.0 ☐	500 ☐	930 ☐
Tin	680 ☐	20,400 ☐	0.07 ☐	0.7 ☐	70 ☐	1,800 ☐
Uranium	200 ☐	6,100 ☐	0.03 ☐	0.3 ☐	30 ☐	10,000 ☐
Vanadium						270 ☐

Key: R DEC-Residential Direct Exposure Criterion
I/C DEC-Industrial/Commercial Direct Exposure Criterion
GA PMC-GA Ground-water Class Pollutant Mobility Criterion
GB PMC-GB Ground-water Class Pollutant Mobility Criterion
R SVVC-Residential Soil Vapor Volatilization Criterion
I/C SVVC-Industrial/Commercial Soil Vapor Volatilization Criterion
GWPC-Groundwater Protection Criterion
SWPC-Surface Water Protection Criterion
R GWVC-Residential Ground-water Volatilization Criterion
I/C GWVC-Industrial/Commercial Ground-water Volatilization Criterion
mg/kg-milligrams per kilogram
ppmv-parts per million volume
µg/L-micrograms per liter
SPLP-Synthetic Precipitation Leaching Procedure
mg/L-milligrams per liter
N/A not applicable
[1] Alternative Criterion for SWPC and Vol C
[2] This criterion applies to all forms of chlordane
[3] This criterion applies to all forms of DDT (DDD and DDE)

Blank cells – No fast track criteria have been calculated.

[4] This criterion applies to all forms of Endosulfan including the I and II isomers and Endosulfan sulfate
[5] This criterion applies to all forms of Endrin including Endrin Aldehyde and Endrin Ketone
[6] Total Oxygenates = the sum of: Tert Butyl Alcohol (TBA), MTBE, ethyl-t-butyl ether (ETBE), t-amyl-methyl ether (TAME), diisopropyl ether (DIPE).

If you have a prior Approval for Additional Polluting Substances or Alternative Criteria and are now requesting a new Approval to supercede it, please attach a copy of the prior Approval. This Approval will supercede all criteria listed in the previous Approval; a request for use of fewer than all of the previously approved criteria may require additional site-specific review by the Department.

Rem ID# TBD

Signature of Person Requesting Approval

Signature	6/13/2017 Date
Stefanie K. Wierszchalek Printed Name of Signatory	Hydrogeologist (Fuss & O'Neill,Inc) Title (if applicable)

This completed form should be submitted to:

REMEDIATION DIVISION, 2nd Floor
BUREAU OF WATER PROTECTION AND LAND REUSE
DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION
79 ELM STREET
HARTFORD, CT 06106-5127

Section Below Reserved for DEEP Approval

☐ The Request received by DEEP on / / is hereby approved.

Nothing in this approval shall affect the Commissioner's authority to institute any proceeding, or take any action to prevent or abate pollution, to recover costs and natural resource damages, and to impose penalties for violations of law, if any. If at any time the Commissioner determines that the approved actions have not fully characterized the extent and degree of pollution or have not successfully abated or prevented pollution, the Commissioner may institute any proceeding, or take any action to require further investigation or further action to prevent or abate pollution. This approval applies only to the criteria identified in this request. In addition, nothing in this approval shall relieve any person of his or her obligations under applicable federal, state and local law.

*This approval expires eight years from the date approved unless otherwise extended by the Commissioner in writing.

_____ _____

Patrick F. Bowe
Director
Remediation Division
Bureau of Water Protection and Land Reuse

Date Approved

Section Below Reserved for DEEP Disapproval

☐ The Request received by DEEP on / / is hereby disapproved.

Rationale:

_____

_____

_____ _____

Patrick F. Bowe
Director
Remediation Division
Bureau of Water Protection and Land Reuse

Date Disapproved

You may re-submit the request if and when the reason(s) for disapproval have been adequately addressed.