Appendix E

Preliminary Opinion of Probable Cost

12-5182-001
September 27, 2023

Thomas Madden, AICP
Associate Principal
BFJ Planning
115 Fifth Avenue, 3rd Fl.
New York, NY 10003

Re: **Preliminary Opinion of Probable Cost**
Remediation
Hartford-Brainard Airport
233 Maxim Road/Lindbergh Drive
Hartford, CT

Dear Mr. Madden:

Tighe & Bond, Inc. (Tighe & Bond) has developed a preliminary Opinion of Probable Cost (OPC) for remediation at the Hartford-Brainard Airport located at 233 Maxim Road/Lindbergh Drive in Hartford, Connecticut (the "Site"). This preliminary OPC includes costs associated with remediation of identified and potential soil impacts at the Site.

The preliminary costs were developed using recent as-bid pricing from projects of similar size and scope and industry standard pricing. As soil conditions beneath Site buildings/structures were not investigated during prior assessments, it is assumed that impact would be present. A 100% contingency has been applied to cover these anticipated remediation costs, as detailed in the summary table at the end of this preliminary OPC.

Background

Site investigations were previously completed as part of an assessment of the current and potential alternative uses of the Site. Tighe & Bond completed a Phase I ESA in April 2023, a Draft Phase II/III ESA in August 2023, and a Draft Preliminary Remedial Action Plan (RAP) in August 2023. During the Phase I ESA and Draft Phase II/III ESA, a total of 5 Recognized Environmental Conditions (RECs) and 24 Areas of Concern (AOCs) were identified:

- REC-1: Historical Releases (throughout developed portions of the Site)
- AOC-1: Historical Hangar Operations (two locations)
- AOC-2/REC-2: Underground Storage Tanks (twenty-eight locations)
- AOC-3: Aboveground Storage Tanks (twelve locations)
- AOC-4: Former Hazardous Waste Storage Container
- AOC-5/REC-3: Former Fuel Distribution Boxes and Product Delivery Line
- AOC-6: Oil/Water Separators (eight locations)
- AOC-7: Airport Maintenance Facilities (three locations)
- AOC-8: Aircraft Maintenance and Repair Facilities (five locations)
- AOC-9: Aircraft Deicing
- AOC-10: Fuel Truck Parking (three locations)
- AOC-11: T-Hangar Buildings (five adjacent locations)
- AOC-12: CT Aero Tech School
- AOC-13/REC-4: Soil and Groundwater Impacts from Historical Airport Activities and/or Historical Fill Utilized at the Site
- AOC-14: Electrical Transformers (multiple locations)
- AOC-15: Diesel Generators (four locations)
- AOC-16: Dumpsters (seven locations)
- AOC-17: Main Regional Jet Fuel Supply Line

- AOC-18: Soil Pile
- AOC-19: Potential Surficial Impacts from Hazardous Building Materials (past and present building envelopes)
- AOC-20: Aqueous Film-Forming Foam (six locations)
- AOC-21/REC-5: Aircraft Accidents
- AOC-22: Former Police Firing Range
- AOC-23: Outfalls at Connecticut River (two locations)
- AOC-24: Potential Airborne Deposition of Impact (site-wide)
- Off-Site AOC: Potentially Impacted Groundwater Migrating to the Site from Off-Site Sources

Most AOCs/RECs were either directly or indirectly investigated as part of this assessment. As documented in the Draft Phase II/III ESA, 30 Release Areas (RAs) were identified:

- RA-1: Historical Release of Aviation Gasoline
- RA-2: CAA Maintenance Shop - Former Gasoline and Diesel USTs and Dispenser Island
- RA-3: Hangar H1 - Former 10,000-Gal. UST
- RA-4: Hangar H2 - Potential Former Three 4,000-Gal. USTs and Hydrant Dispenser
- RA-5: Hangar H4 - Potential Former Three 4,000-Gal. USTs and Hydrant Dispenser
- RA-6: Hangar H4 - Potential Former Fuel Farm
- RA-7: Hangar H1 - Former Waste Oil AST
- RA-8: CAA Fuel Farm
- RA-9: Former Fuel Box 1
- RA-10: Hangar H4
- RA-11: T-Hangars
- RA-12: Fill Material (site-wide)
- RA-13: Historical Application of Pesticides (site-wide)
- RA-14: CAA Maintenance Shop - Pole-Mounted Transformer
- RA-15: State Police Hangar - Pole- and Pad-Mounted Transformers
- RA-16: Soil Pile
- RA-17: Building Envelope – State Police Abandoned Building
- RA-18: Building Envelope – State Police Hangar
- RA-19: Building Envelope – CAA Administration Building
- RA-20: Building Envelope – CAA Maintenance Garage
- RA-21: Building Envelope – CAA Maintenance Shop
- RA-22: Building Envelope – Hangar H1
- RA-23: Building Envelope – Office/Restaurant
- RA-24: Building Envelope – FAA Control Tower
- RA-25: Building Envelope – CT Aero Tech School
- RA-26: Building Envelope – Engine Test Room
- RA-27: Building Envelope – T-Hangar (240 Lindbergh Drive)
- RA-28: Building Envelope – T-Hangar (1-10)
- RA-29: Former Police Firing Range
- RA-30: Airborne Deposition of Impact (site-wide)

The detected concentrations of extractable total petroleum hydrocarbons (ETPH), volatile organic compounds (VOCs), several individual semi-volatile organic compounds (SVOCs), lead, and/or per- and polyfluoroalkyl substances (PFAS) within RA-2, RA-7, RA-8, RA-10, RA-12, RA-14, RA-15, RA-16, RA-19, RA-29, and RA-30 were above the Connecticut Department of Energy and Environmental Protection (CTDEEP) Remediation Standard Regulation (RSR) criteria and remediation would be necessary under a potential redevelopment scenario.

Groundwater monitoring that was completed during the draft Phase II/III ESA have not identified significant impacts above RSR criteria. However, arsenic and the polycyclic aromatic hydrocarbon (PAH) acenaphthylene were detected above the RSR surface water protection criteria (SWPC) in groundwater samples collected from certain monitoring wells that are indicative of potential fill related impacts and/or background conditions. As compliance could be demonstrated using downgradient monitoring wells and/or calculation of an alternative SWPC, remediation to address groundwater impacts is not necessary at this time.

Proposed Remedial Activity

This preliminary OPC was developed for the following proposed remedial activity, with a 100% contingency to account for certain previously untested areas (i.e., beneath buildings/structures):

As discussed in Tighe & Bond's draft Preliminary RAP, several different remedial techniques were evaluated that could be used at the Site to achieve compliance with the RSRs, specifically residential standards. Based on the data obtained, both residential and industrial/commercial criteria were exceeded in most samples; as such, use of an Environmental Use Restriction (EUR) prohibiting residential use of the Site and remediation to industrial/commercial standards is not prudent at this time. As the Site is only moderately impacted based on the data obtained and to provide flexibility in evaluating potential alternative uses, removal and off-Site disposal of impacts above RSR criteria was selected as the remedial approach for all impact above the high water table. Remediation is not required for impact below the high water table for GB pollutant mobility criteria (GB PMC) exceedances. For direct exposure criteria (DEC) exceedances below the high water table, remediation is impracticable; however, the soil could be rendered inaccessible with an Environmental Use Restriction (EUR). Prior to completion of a final RAP, a Phase III ESA should be completed to define the full extent of impacts at the AOCs and RAs.

Although not proposed at this time, other remedial strategies could be utilized. Should the Site be redeveloped, and new buildings constructed, certain polluted materials throughout the Site could be excavated, consolidated, and capped under a Licensed Environmental Professional (LEP) certified Engineered Control (EC) and/or made inaccessible in accordance with the RSRs to address DEC exceedances. Under these EC methods, filing of an EUR would be necessary. As previously noted, residential restrictions under an EUR are not prudent at this time; but could be utilized if unforeseen environmental conditions are identified during Phase III ESA testing and remediation . The use of an EC or other restrictions could be evaluated as part of the proposed redevelopment of the Site. Further, for site-wide fill impacts and/or airborne deposition of impacts (RA-12 and RA-30, respectively), additional data obtained from a complete Phase III ESA could be evaluated for compliance using statistical analysis (i.e., calculation of the 95% upper confidence limit). It may be possible to excavate only a few areas of elevated impact to achieve compliance for these RAs. However, this cannot be determined at this time; as such, the approach to remove the entirety of the impact above the high water table is the most prudent remedial approach at this time.

The following excavations are proposed:

<u>RA-7 Excavation (Hangar H1 – Former Waste Oil AST)</u>

Excavation of an approximately 20 foot by 20 foot area to a depth of 8 feet or the water table where ETPH was above the residential DEC (RES DEC), industrial/commercial DEC (I/C DEC), and GB PMC and certain VOCs and 2-methylnaphthalene were above the GB PMC in soil sample B-44 (3-5').

RA-8 Excavation (CAA Fuel Farm)

Excavation of an approximately 20 foot by 20 foot area to a depth of 7 feet or the water table where ETPH was above the RES DEC, I/C DEC, and GB PMC and certain VOCs were above the GB PMC in soil sample B-91 (3-5').

RA-10 Excavation (Hangar H4)

Excavation of an approximately 20 foot by 20 foot area to a depth of 4 feet bgs where ETPH was above the RES DEC and several SVOCs were above the RES DEC, I/C DEC, and/or GB PMC in soil sample B-108 (1-2').

RA-12(1) Excavation (Fill Material – B-105)

Excavation of an approximately 20 foot by 20 foot area to a depth of 6 feet bgs where several individual PAHs were above the RES DEC, I/C DEC, and/or GB PMC in soil sample B-105 (3-5').

RA-12(2) Excavation (Fill Material – B-112)

Excavation of an approximately 20 foot by 20 foot area to a depth of 2 feet bgs where indeno(1,2,3-cd)pyrene was above the RES DEC and GB PMC in soil sample B-112 (0-2').

RA-12(3) Excavation (Fill Material – B-118)

Excavation of an approximately 20 foot by 20 foot area to a depth of 2 feet bgs where ETPH was above the RES DEC and several individual PAHs were above the RES DEC, I/C DEC, and/or GB PMC in soil sample B-118 (0-2').

RA-12(4) Excavation (Fill Material – B-120)

Excavation of an approximately 20 foot by 20 foot area to a depth of 2 feet bgs where ETPH was above the RES DEC and several individual PAHs were above the RES DEC, I/C DEC, and/or GB PMC in soil sample B-120 (0-2').

RA-12(5) Excavation (Fill Material – B-125)

Excavation of an approximately 20 foot by 20 foot area to a depth of 2 feet bgs where several individual PAHs were above the RES DEC, I/C DEC, and/or GB PMC in soil sample B-125 (0-2').

RA-12(6) Excavation (Fill Material – B-132)

Excavation of an approximately 20 foot by 20 foot area to a depth of 2 feet bgs where several individual PAHs were above the RES DEC, I/C DEC, and/or GB PMC in soil sample B-132 (0-2').

RA-12(7) Excavation (Fill Material – B-135)

Excavation of an approximately 20 foot by 20 foot area to a depth of 2 feet bgs where several individual PAHs were above the RES DEC, I/C DEC, and/or GB PMC in soil sample B-135 (0-2').

RA-12(8) Excavation (Fill Material – HA-3)

Excavation of an approximately 20 foot by 20 foot area to a depth of 2 feet bgs where several individual PAHs were above the RES DEC, I/C DEC, and/or GB PMC in soil sample HA-3 (0-0.5').

RA-12(9) Excavation (Fill Material – HA-4)

Excavation of an approximately 20 feet by 20 foot area to a depth of 2 feet bgs where ETPH was above the RES DEC and several individual PAHs were detected above the RES DEC, I/C DEC, and/or GB PMC in soil sample HA-4 (0-0.5').

RA-12(10) Excavation (Fill Material – HA-5)

Excavation of an approximately 20 foot by 20 foot area to a depth of 2 feet bgs where several individual PAHs were above the RES DEC, I/C DEC, and/or GB PMC in soil sample HA-5 (0-0.5').

RA-12(11) Excavation (Fill Material – HA-21)

Excavation of an approximately 20 foot by 20 foot area to a depth of 2 feet bgs where several individual PAHs were above the RES DEC, I/C DEC, and/or GB PMC in soil sample HA-21 (0-0.5').

RA-12(12) Excavation (Fill Material – HA-22)

Excavation of an approximately 20 foot by 20 foot area to a depth of 2 feet bgs where several individual PAHs were above the RES DEC, I/C DEC, and/or GB PMC in soil sample HA-22 (0-0.5').

RA-12(13) Excavation (Fill Material – HA-47)

Excavation of an approximately 20 foot by 20 foot area to a depth of 2 feet bgs where several individual PAHs were above the RES DEC, I/C DEC, and/or GB PMC in soil sample HA-47 (0-0.5').

RA-14 Excavation (CAA Maintenance Shop – Pole-Mounted Transformer)

Excavation of an approximately 10 foot by 10 foot area to a depth of 2 feet bgs where ETPH was detected above the RES DEC, I/C DEC, and GB PMC in soil sample HA-11 (0-0.5').

RA-15(1) Excavation (State Police Hangar – Pole-Mounted Transformer)

Excavation of an approximately 10 foot by 10 foot area to a depth of 2 feet bgs where ETPH was detected above the RES DEC in soil sample HA-12A (0-0.5').

RA-15(2) Excavation (State Police Hangar – Pad-Mounted Transformer)

Excavation of an approximately 10 foot by 10 foot area to a depth of 2 feet bgs where ETPH was detected above the RES DEC in soil sample HA-12B (0-0.5').

RA-16 Excavation (Soil Pile)

Excavation of an approximately 900 cubic yard soil pile where several individual PAHs were detected above the RES DEC, I/C DEC, and/or GB PMC in soil sample HA-24 (0-2').

RA-19 Excavation (Building Envelope – CAA Administration Building)

Excavation of the building envelope measuring approximately 800 square-feet to a depth of 2 feet bgs where lead was detected above the RES DEC in soil sample HA-30 (0-0.5')

RA-29 Excavation (Former Police Firing Range)

Excavation of an approximately 20 foot by 20 foot area to a depth of 2 feet bgs where lead was detected above the RES DEC in soil sample HA-46 (0-0.5').

RA-30 Excavation (Airborne Deposition of Impact)

Excavation of an approximately 20 foot by 20 foot area to a depth of 2 feet bgs where PFAS was detected above the GB PMC in soil sample HA-49 (0-0.5').

Following completion of soil remediation, a compliance groundwater monitoring plan would be implemented as required by the RSRs.

Assumptions and Qualifiers

The following assumptions and qualifiers apply to this preliminary OPC:

- Preliminary OPC contractor, transport, and disposal costs are based on recent bid information obtained from a remediation contractor for projects in Connecticut. Actual contractor costs to be determined following bidding.
- Preliminary OPC is based on data obtained from previous investigations, which have not defined the extent of impacts. A Phase III ESA should be completed prior to a final RAP and to further define remediation costs. The preliminary OPC does not include costs for completion of a Phase III ESA. In addition, given the size of the Site and lengthy history, impact above RSR criteria may exist at other locations that were not previously tested that would require remediation. The preliminary OPC contains a contingency to address impact that could be present beneath Site buildings/structures, assuming that impact would be localized to the periphery of hangars and garage/shop areas where petroleum products and hazardous materials are typically stored and handled. Observations made during Site assessments has not identified significant staining indicative of a release throughout these areas. However, should significant contamination be identified, additional remedial costs beyond this preliminary OPC may be incurred.
- Preliminary OPC assumes use of common fill for backfilling of remedial excavations. Use of structural fill to support buildings and other Site improvements is not included.
- Preliminary OPC is specific to the current limits of the Hartford-Brainard Airport property, as identified during Tighe & Bond's April 2023 Phase I ESA. The preliminary OPC does not include any off-Site remediation, including potential remediation needs related to a contemplated land-swap with the south, adjacent Metropolitan District Commission (MDC) property and at outfalls along the Connecticut River.
- Preliminary OPC assumes dewatering is not needed during excavation activities.
- Preliminary OPC assumes that groundwater remediation will not be necessary and compliance with the RSRs could be demonstrated using downgradient monitoring wells and/or calculation of alternative criteria in combination with monitored natural attenuation.
- Preliminary OPC does not include costs for building demolition including abatement of hazardous building materials.
- Preliminary OPC does not include costs for site demolition including but not limited to removal of pavement, runways, utility systems, subsurface structures. Also does not include costs for repairs to the dyke/berms systems.
- Preliminary OPC does not include additional remedial costs for PFAS due to potential regulatory changes, including development of new criteria.

Tighe & Bond has no control over the cost or availability of labor, equipment or materials, or over market conditions or the Contractor's method of pricing. The preliminary OPCs expressed herein are made on the basis of Tighe & Bond's professional judgment and experience. Tighe & Bond makes no guarantee nor warranty, expressed or implied, that the bids or the negotiated cost of the Work will not vary from those presented in this Preliminary OPC.

Summary

Based on the draft Phase II/III ESA findings and current assumptions, Tighe & Bond has developed an OPC for remediation via excavation of identified soil impacts above RSR criteria at the Site, a summary of which is provided below:

Items	Estimated Costs (rounded)
Remediation Oversight, Post-Excavation Sampling, Documentation, and Reporting	$100,000
Excavation, Loading, Transport, Disposal, and Backfill	$900,000
Subtotal	**$1,000,000**
100% Contingency[1]	**$1,000,000**
TOTAL	**$2,000,000**
Notes: 1 = includes remediation of potential impact at previously untested locations beneath buildings/structures.	

A more detailed breakdown of the costs presented above is provided in the attached Table.

If you have any questions regarding the attached OPC, please contact Jim Olsen at (860) 805-8776 / JTOlsen@tighebond.com.

Very truly yours,
TIGHE & BOND, INC.

James T. Olsen, PG, LEP
Vice President

Enclosures – Preliminary Opinion of Probable Costs

Hartford-Brainard Airport
Preliminary Opinion of Probable Costs

Release Area	Sampling Location w/RSR Exceedance	Volume Calculations		Remedial Contractor Costs	Environmental Consultant Costs	Total
		Volume (cu.yd.)	Tonnage	Sub-Total	Sub-Total	
RA-7: Hangar H1 - Former Waste Oil AST	B-44	119	178	$57,778	-	-
RA-8: CAA Fuel Farm	B-91	104	156	$50,556	-	-
RA-10: Hangar H4	B-108	59	89	$28,889	-	-
RA-12: Fill Material	B-105	89	133	$43,333	-	-
	B-112	30	44	$14,444	-	-
	B-118	30	44	$14,444	-	-
	B-120	30	44	$14,444	-	-
	B-125	30	44	$14,444	-	-
	B-132	30	44	$14,444	-	-
	B-135	30	44	$14,444	-	-
	HA-3	30	44	$14,444	-	-
	HA-4	30	44	$14,444	-	-
	HA-5	30	44	$14,444	-	-
	HA-21	30	44	$14,444	-	-
	HA-22	30	44	$14,444	-	-
	HA-47	30	44	$14,444	-	-
RA-14: CAA Maintenance Shop - Pole-Mounted Transformer	HA-11	7	11	$3,611	-	-
RA-15: State Police Hangar - Pole- and Pad-Mounted Transformers	HA-12A	7	11	$3,611	-	-
	HA-12B	7	11	$3,611	-	-
RA-16: Soil Pile	HA-24	889	1,333	$433,333	-	-
RA-19: Building Envelope - CAA Administration Building	HA-30	59	89	$28,889	-	-
RA-29: Former Police Firing Range	HA-46	30	44	$14,444	-	-
RA-30: Airborne Deposition of Impact	HA-49	30	44	$14,444	-	-
	Totals:		**2,633**	**$855,833**	**$85,000**	**$940,833**
	Totals (rounded):			**$900,000**	**$100,000**	**$1,000,000**
	100% Contingency:					***$1,000,000***
	Total with 100% Contingency:					**$2,000,000**

Notes:
Contingency includes remediation of previously untested locations beneath buildings/structures.