Carrier
A United Technologies Company

Carrier Corporation
Facilities & Maintenance Services
Carrier Parkway
PO Box 4808
Building TR-7
Syracuse, New York 13221

April 8, 2013

Mr. Dan Hayes
Environmental Engineer 1
New York State Department of Environmental Conservation
Division of Water, Region 7
615 Erie Boulevard West
Syracuse, New York 13204-2400

Re: Basin 001 PCB Sampling Plan
Carrier Corporation – Syracuse, New York

Dear Mr. Hayes:

Please find attached a scope of work for activities Carrier will implement over the upcoming months to determine the potential pathways of polychlorinated biphenyl (PCB) migration into Basin 001 storm lines. During the March 5, 2013, meeting at New York State Department of Environmental Conservation (NYSDEC) offices, Carrier agreed to provide a summary of planned activities to your department for review and comment.

The three tasks Carrier will implement during the upcoming months include:

1. A groundwater investigation along various sections of Basin 001 storm lines
2. A surface sediment sampling program
3. An in-line water and sediment sampling program

Task 1 is s scheduled to begin on April 15, 2013. Tasks 2 and 3 will begin mid- to late April, with field work completed by end of August 2013.

The attached scope of work describes, in more detail, the elements and approach of the Basin 001 PCB Sampling Plan.

Please contact Nelson Wong at 315-432-6028 with any questions.

Sincerely,

Dave Francisco
Manager, Facilities and Maintenance Services

cc: Ms. Tara Blum — NYSDEC DER, Syracuse
Mr. Mark Sergott — NYSDOH, Troy
Mr. Nelson Wong — Carrier Corporation
Mr. John Wolski — UTC

Enclosure

SCOPE OF WORK
Basin 001 PCB Sampling Plan —
Groundwater Investigation, Surface Sediment Sampling,
and In-Line Water and Sediment Sampling
April 8, 2013

The Carrier Corporation Thompson Road facility in Syracuse, New York, (Carrier) currently discharges storm water runoff under its State Pollutant Discharge Elimination System (SPDES) Permit (No. NY 000 1163). As of September 1, 2012, Carrier's SPDES permit covers Outfalls 01A, 001, 002, 003, and 004. Under its SPDES Permit, Carrier performs monthly monitoring of polychlorinated biphenyls (PCBs) at Outfall 01A, and at Outfalls 001 and 002 if discharge occurs. Recent PCB detections have prompted Carrier to evaluate potential sources of PCBs in the 01A discharge. A four-phased Basin 001 sampling approach has been developed to determine possible source(s) of PCBs in the 01A discharges:

- **Groundwater Investigation:** The purpose of this groundwater investigation is to determine, to the extent possible, if PCB-impacted groundwater may be infiltrating into the Basin 001 storm lines.

  Five areas along the Basin 001 storm lines (**Figure 1**) have been targeted for investigation based on historical sediment and/or storm water data from nearby manholes, or based on prior consent-order-related investigations (e.g., MW20 former degreaser area).

  1. TR4/TR5 Line — Building TR4 near MH35 — In Summer 2012, there was a fire main break just outside the Building TR4 cafeteria doors, near MH35. When the break occurred, Carrier excavated soils to make repairs to the water line. A soil sample from the soil stockpile was analyzed for Total PCBs. Aroclor 1260 was detected at 1.6 milligrams/kilogram (mg/kg). Three (3) borings are proposed in this area.

  2. TR4/TR5 Line — Building TR4, north end, near MH39 — Historical water samples from this manhole have had detections of PCBs above the 0.2 microgram/liter (ug/L) per Aroclor outfall discharge limit using U.S. Environmental Protection Agency (USEPA) Method 608. Additionally, PCB-containing sediments have historically accumulated in MH39. Three (3) borings are proposed in this area.

  3. TR4/TR5 Line — Diagonal line in Parking Lot R (PLR) — The "diagonal line" in PLR is approximately 600 to 700 feet long, and runs from MH42 to MH2, which is inside the storm water treatment building (SWTB). Past water sampling from these two manholes have shown an increase in PCB concentration between these two manholes (i.e., water samples from MH2 had higher PCB concentrations than did water samples from MH42). Additionally, past consent-order-related investigation of a former degreaser area in the southeast corner of PLR found elevated volatile organic compounds (VOCs) and free product at MW20. A potentiometric map indicated that shallow groundwater flow was in the general direction of the diagonal line. Therefore, three (3) borings are proposed along this diagonal line.

4. 007A Line — A relatively short (approximately 350 feet long) storm line is located on the far eastern side of PLR. A degreaser was formerly located adjacent to the storm line near its upgradient end. Groundwater samples collected in the former degreaser area found elevated VOCs and free product. Three (3) borings are proposed in this area.

5. TR19 Line — Water samples collected from manholes along this storm line have been non-detect (ND) for PCBs upgradient of MH177. From MH177, the next downgradient manhole is MH7, which has had higher PCB detections (up to 9.7 ug/L using USEPA Method 1668). Another storm line (the A&R line) runs parallel (approximately 10 feet to the east) to the TR19 line from MH175 to MH182. As with the TR19 line, water samples have shown an increase in PCB concentrations from the upgradient manhole (MH175 – ND) to the downgradient manhole (MH182 – 0.407 ug/L) using Method 608. Four (4) borings are proposed in this area.

EnSafe will advance 16 direct push technology (DPT) soil borings to groundwater at the five areas indicated on the attached figure. Specific DPT locations will be marked in the field by EnSafe personnel. Borings will be advanced adjacent to storm lines, and every precaution to avoid hitting a storm line will be made. EnSafe will advance the borings to groundwater, estimated to be 7 to 9 feet below ground surface (bgs).

While the full DPT boring will be sampled and field screened using a photoionization detector (PID), only a saturated soil sample from the uppermost sampling interval below the groundwater table will be submitted to Test America, North Canton, Ohio, for Total PCB analysis using USEPA Method 8082. If EnSafe personnel observe unsaturated soil conditions that indicate possible contamination (via visual and olfactory observations, or PID readings), an additional soil sample may be submitted to the lab.

All DPT borings will be converted to temporary wells. EnSafe will install a 1-inch polyvinyl chloride (PVC) temporary monitoring well to an estimated depth no greater than 15 feet bgs. The bedding material of the storm lines is not the target screening zone of the temporary well, though it may be placed at that depth interval. Groundwater samples will be submitted to Test America, North Canton, Ohio, for Total PCB analysis using USEPA Method 8082. The method detection levels (MDLs) per Aroclor using this method are each less than the New York State Water Quality Standard (NYS WQS) for Total PCBs of 90 nanograms per liter (ng/L).

All temporary wells will be completed flush with ground surface and sealed with a water-tight cap. The temporary wells will remain in place and will not be abandoned until directed to do so by UTC and Carrier.

EnSafe has scheduled fieldwork to begin the week of April 15, 2013.

- **Surface Sediment Samples:** The purpose of this investigation is to determine if there is a localized or perhaps widespread problem of PCB-laden sediments entering the storm line during storm events.

  In November 2012, shallow surface soil samples were collected in the grassy medians between Buildings TR4 and TR5. The shallow surface soils samples were located outside of electrical vaults which housed transformers, some of which may have historically used PCB-containing oils. These locations are identified as TR4 Fan Room 2, TR4 Substation M, and TR5 Substation N. The investigation found low level (1 µg/kg or less) PCBs in all but one soil sample. While the surface soil samples collected were from grassy medians, with little erosion likely, Carrier has expressed a concern that other areas in Basin 001 may have higher erosion rates. If these areas are associated with a possible historical PCB release to shallow soils, then PCB-containing surface soils may be continually eroding into the storm lines and accumulating along laterals and manhole sumps, and may be periodically washing out to Outfall 01A.

  To capture surface sediments, EnSafe will place a section of high-flow filter fabric (available for purchase in 3-ft x 100-ft rolls, typically) at up to 12 manhole/catch-basin locations (**Figure 1**). The purpose of filter fabric placement is to trap sediments as they would normally wash into the storm lines while allowing storm water to enter the catch basin. Although a high-flow filter fabric is recommended in this application, surface water runoff may still backup and cause localized flooding during a rain event. Carrier personnel will be responsible for monitoring the suitability of leaving the filter fabric in place.

  The insert below provides information on a local (to Syracuse) vendor that may provide suitable filter fabric for this task:

E.J. Prescott 241 Farrell Road Syracuse, New York 13209 315-451-1272 POC: Rick 3-ft roll x 100-ft long non-woven Mirafi 140N in stock, $20. Specification sheet is attached at end of this SOW. Rate 135 gpm and US Sieve 70. Material can be doubled-over if more strength is needed. High flow rate (70-145 gpm/sf) woven monofilaments, 12-ft roll x 300-ft long roll, $1,200 *other filter fabric available

Accumulation of a suitable sample aliquot may take multiple storm events, or sediment may not accumulate at all. Correct selection of filter fabric may require some trial and error (i.e., grain size of surface sediment that can be captured by a specific filter fabric), meaning that adjustments to the fabric may be necessary.

These selected sample collection locations will need to be inspected to determine if sediments are accumulating. If not, a new catch-basin location or filter fabric may be selected.

Factors used to select catch-basins for sediment capture are: 1) if the catch-basin has had historical in-line PCB-laden sediments; 2) if the catch-basin has a removable grated inlet (as opposed to a solid manhole cover); and 3) is proximate to former outdoor transformer locations that had drains associated with them. As mentioned above, 12 locations have been preliminarily selected for sediment capture. However, Carrier will need to ensure that the catch-basin has a removable grated inlet, otherwise the location will not capture sediments.

Fieldwork may be coordinated by EnSafe and/or Carrier with assistance from subcontractor personnel (e.g., Robert English with Test America, Syracuse, New York) in mid to late April 2013. Once the filter fabric has been placed and sediments have accumulated, Carrier will contact EnSafe and the filter fabric will be removed and the sediment samples prepared for shipment to Test America, North Canton, Ohio, for Total PCB analysis using Method 8082.

- **In-Line Water and Sediment Samples:** The purpose of this investigation is to determine if PCBs are continually present in water samples and, if possible, to determine where the PCBs are entering the storm lines. A second component of the proposed sampling program is to determine if accumulated sediments in various manholes may represent a PCB concern in 01A discharges.

  In 2012, Carrier sampled both water and sediment from various manholes in Basin 001. Several of the most down-gradient locations have had PCB detections that are high enough to potentially cause a PCB exceedance at Outfall 01A (e.g., MH2 – 0.448 µg/L GB Method; MH182 - 0.402 µg/L Method 608; MH7 – 9.7 µg/L Method 1668). Up-gradient manholes (e.g., MH41, MH42, MH39, and MH175) also had some lower PCB detections. While it is possible that PCB detections above the SPDES permit limit of 0.2 µg/L in in-line water samples can result in an 01A detection, increased risk of a detection at the outfall comes from the higher PCB detections closer to the outfall. By collecting in-line water and sediment samples over multiple rain events (varying in duration and intensity), Carrier can better understand the extent of PCB impact in its Basin 001 lines:

  - MH175 on the A&R line — located at the southwest corner of Parking Lot F

- MH007A on the PLR East line — located on the eastern side of former Building TR3
- Manholes MH42, MH29, and MH25 on the TR4/TR5 line — located between Buildings TR4 and TR5
- MH43 on the TR19 line — located at the northwest corner of Parking Lot L
- MH177 (or MH14) on the TR19 line — located off the northwest corner of Building TR15
- MH19 on the TR4/TR5 line — located at northwest corner of Parking Lot J

Nine manholes are proposed for three in-line water sampling events during the period from April to July 2013. Three separate sampling events will be targeted as follows, but are rainfall dependent:

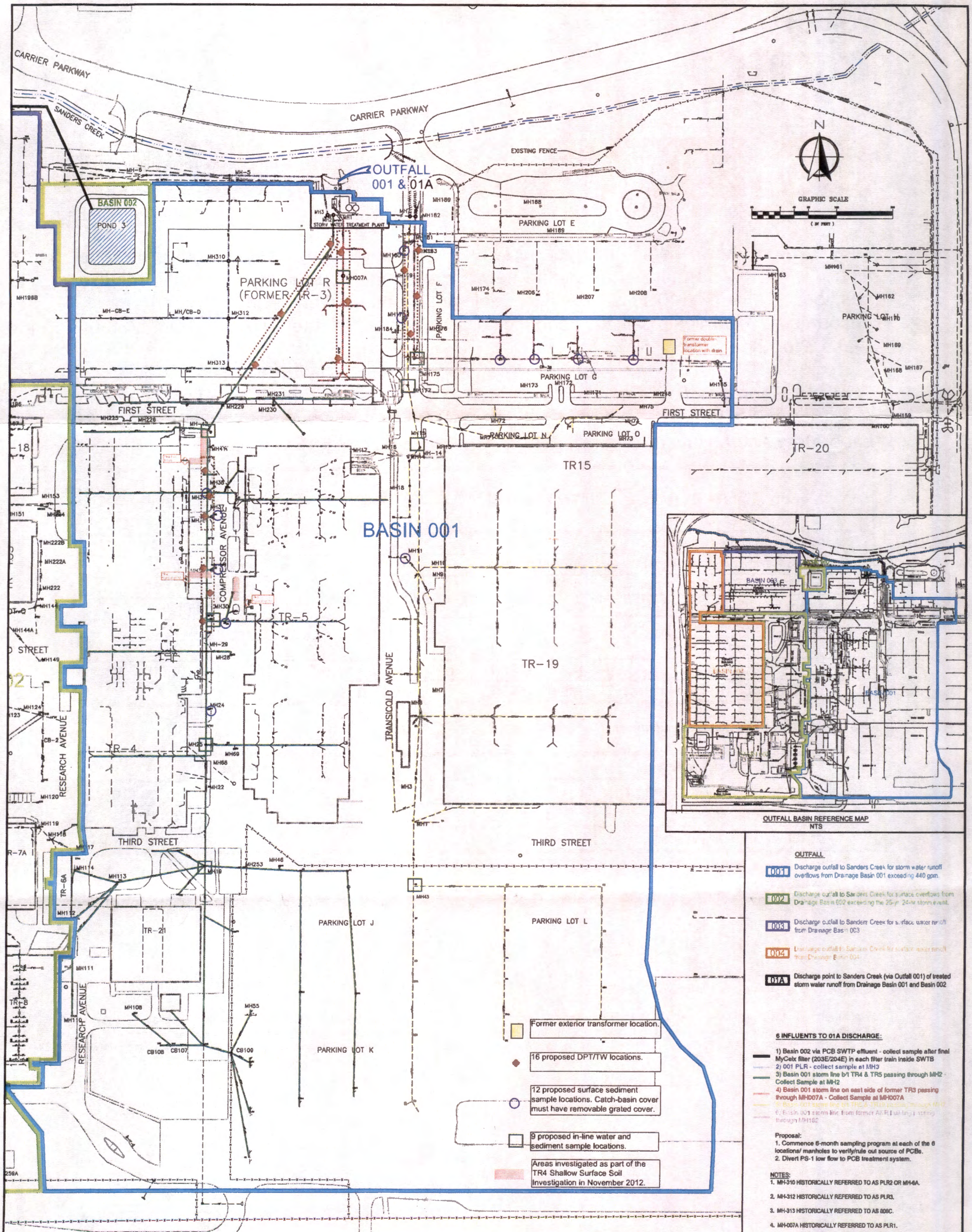
— Event #1 – likely to occur in April/May 2013 during a "significant" rain event. Significant will be a rain event that generates flow in storm water piping of these manholes.

— Event #2 – likely to occur in May/June 2013

— Event #3 – likely to occur in June/July 2013

Similarly, nine manholes are proposed for one-time sediment sampling, just after the first water sampling event April/May 2013. The sediment sampling should occur **AFTER** the first storm water sampling event, so that total suspended solids (TSS) in the water sample are minimized. The sediment sampling of these nine manholes is a one-time sampling event.

Fieldwork will be coordinated by EnSafe and implemented by subcontractor personnel (e.g., Robert English with Test America, Syracuse, New York) during the time period specified above and in a similar manner to the PCBMP sampling program.



SCALE: 1" = 80' AT FULL SIZE E
DRAWN BY: MM
REVIEWED BY: MH
PROJECT #13832

ENSAFE

Proposed Basin 001 Sampling Plan Locations
April 2013

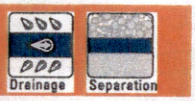
CARRIER CORPORATION
SYRACUSE, ONONDAGA COUNTY, NEW YORK

FIGURE 1

TENCATE
Mirafi®

TENCATE GEOSYNTHETICS
Americas

Mirafi® 140N



Mirafi® 140N is a needlepunched nonwoven geotextile composed of polypropylene fibers, which are formed into a stable network such that the fibers retain their relative position. Mirafi® 140N is inert to biological degradation and resists naturally encountered chemicals, alkalis, and acids. Mirafi® 140N meets AASHTO M288-06 Class 3 for Elongation > 50%.

TenCate Geosynthetics Americas Laboratories are accredited by a2La (The American Association for Laboratory Accreditation) and Geosynthetic Accreditation Institute – Laboratory Accreditation Program (GAI-LAP). NTPEP Number: GTX-2012-01-009

Mechanical Properties	Test Method	Unit	Minimum Average Roll Value	
			MD	CD
Grab Tensile Strength	ASTM D4632	lbs (N)	120 (534)	120 (534)
Grab Tensile Elongation	ASTM D4632	%	50	50
Trapezoid Tear Strength	ASTM D4533	lbs (N)	50 (223)	50 (223)
CBR Puncture Strength	ASTM D6241	lbs (N)	310 (1380)	
Apparent Opening Size (AOS)[1]	ASTM D4751	U.S. Sieve (mm)	70 (0.212)	
Permittivity	ASTM D4491	sec^{-1}	1.7	
Flow Rate	ASTM D4491	$gal/min/ft^2$ ($l/min/m^2$)	135 (5500)	
UV Resistance (at 500 hours)	ASTM D4355	% strength retained	70	

[1] ASTM D4751: AOS is a Maximum Opening Diameter Value

Physical Properties	Unit	Typical Value	
Roll Dimensions (width x length)	ft (m)	12.5 x 360 (3.8 x 110)	15 x 360 (4.5 x 110)
Roll Area	yd^2 (m^2)	500 (418)	600 (502)
Estimated Roll Weight	lb (kg)	139 (63)	167 (76)

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Testing Lab 1291.01 & 1291.02