

5.0 CONCLUSIONS

This section presents the conclusions with regard to the nature and extent of chemical constituents and other MGP residuals identified in on-site and off-site areas based on the results of the supplemental field program. Where appropriate, data from the initial field program, as well as historical data has been used in conjunction with data from this field program to develop the conclusions presented in this section. This section also presents the conclusions of the Qualitative Human Exposure Assessment, as well as the findings associated with the private well and basement survey. **Appendix F** presents the detailed findings of the Qualitative Human Exposure Assessment, as well as the private well and basement survey. **Appendix F** also includes a Fish and Wildlife Resources Impact Analysis (FWRIA).

5.1 Bay Shore Site and Adjacent Off-site Locations (Operable Unit 1)

Surface Soil

- As part of the initial field program, the PCB Aroclor-1260 was detected in surface soil sample BBSS-09 at 43 mg/kg, located in the southwest corner of the Bay Shore site. Historically, several electric transformers were known to have been located in this area. PCB analysis of subsurface soil samples collected as part of the supplemental field program in the vicinity of BBSS-09 indicated the presence of Aroclor-1260 ranging in concentration of 0.01 mg/kg to 4.7 mg/kg. Sample BBSS-09 was collected from a lens of surficial soil no more than 10 inches in thickness overlying the top of the concrete foundation associated with the former Office Store and Wash Room. Based on these findings, surface soil containing elevated levels of PCBs is limited to an area no greater than 100 square feet and approximately 10 inches in thickness located in the southwest corner of the Bay Shore site.

Subsurface Soil

- With the exception of the former industrial cesspool area located immediately southwest of the former Main Gas Holder, the northern third of the Bay Shore Site does not exhibit elevated levels of BTEX, PAHs or NAPL/Tar at saturated levels. In addition, it appears that the southeastern portion of the Bay Shore Site is free of these MGP-related constituents.
- The highest concentrations of BTEX and PAHs in subsurface soil are found in shallow subsurface soil not exceeding 12 feet in depth, southwest of the former Relief

Holder and within the general vicinity of a former Naphthalene Scrubber. This area extends south to the former locations of the Effluent Water Treatment Facilities, Tar Separators and Tar Settling and Holding Tanks. A second area of elevated BTEX and PAHs in subsurface soil is located in the vicinity of the Tar and Drip Oil Collecting Pits and the former Tar Well located within the southwest corner of the site.

- Immediately downgradient of the site, BTEX and PAHs are present in deeper subsurface soil at a depth of greater than 32 feet below ground surface (bgs). The off-site BTEX and PAH concentrations observed at depths greater than 32 feet are consistent with field observations that indicate tar staining, as well as NAPL/tar at saturated levels within deep subsurface soil immediately downgradient of the Bay Shore site.
- Where detected, saturated NAPL/tar observed in subsurface soil in the central third of the site is generally limited to approximately 20 to 30 feet bgs. The sources of this relatively shallow NAPL/tar are former MGP structures. The occurrence of saturated NAPL/tar in soil at depths greater than 30 feet bgs is generally limited to the southern third of the site and immediately adjacent downgradient areas.
- The observed distribution of NAPL/tar in subsurface soil indicates a southerly migration of this material from on-site source areas primarily located in the southernmost third of the site to downgradient areas. NAPL/tar migration appears to be predominantly horizontal in nature at and below the water table. However, in the vicinity of the southern property boundary, a significant downward vertical migration component appears to have been present. As a result, there appears to be a deep NAPL/tar zone located above the Glacial/Magothy formation interface from the property boundary to as far south as BBSB-88 located approximately 250 feet from the site boundary.
- LNAPL was not observed within shallow monitoring wells or test pits completed within the Bay Shore site. In addition, LNAPL was not observed in shallow monitoring wells located immediately downgradient of the site.
- Based on the results of BTEX/PAH analytical data in subsurface soil and visual observations of recovered soil samples collected from within the Bay Shore Site, the following former structures and/or subsurface soil surrounding these structures are considered source areas of BTEX and PAH compounds:
 - The Relief Holder
 - Naphthalene Scrubber/Oil Separation Tank and Surge Tank located west of the Relief Holder
 - The 54,000 Cubic Foot Gas Holder/Heavy Oil Tank
 - Tar/Oil Separators and Storage Tanks, located in the southern portion of the site
 - Effluent Water Treatment Facilities, located in the southern portion of the site
 - The Cesspool located southwest of the Main Holder
 - Tar/Drip Oil Collection Pit

All of these structures were demolished many years ago, and the aboveground elements removed from the site.

Groundwater

- Consistent with subsurface soil, groundwater data indicates that the northern third of the Bay Shore site is relatively free of elevated BTEX and PAH concentrations in shallow groundwater with total BTEX concentrations not exceeding 100 ug/l and 200 ug/l, respectively at the majority of sample locations. In addition, samples collected from the southeast corner of the site also indicate this area does not exhibit BTEX and PAHs above 10 ug/l.
- Consistent with the initial field program findings, shallow groundwater in the southern half of the Bay Shore site exhibits BTEX and PAHs with the highest concentrations observed southwest of the former Relief Holder, downgradient of the former Tar Separators/Effluent Treatment House, the 54,000 Cubic Foot Gas Holder/Heavy Oil Tank and downgradient of the former Tar and Drip Oil Collection Pit. In addition, BTEX and PAH compounds are present downgradient of the former Tar Well located in the southwestern portion of the site. While the former industrial Cesspool located southwest of the former Gas Holder contains levels of BTEX and PAHs in subsurface soil, groundwater data from BMW-17S indicates relatively low BTEX and PAHs in groundwater downgradient of this area with total BTEX and PAH concentrations of 110.0 ug/l and 159.0 ug/l, respectively.
- On-site deep groundwater at a depth greater than 50 feet bgs was found to exhibit nondetectable to trace levels of BTEX and PAHs, with total BTEX concentrations not exceeding 5 ug/l and total PAH concentrations not exceeding 50 ug/l. However, samples collected along the southern property boundary contained higher levels of BTEX and PAH. This area also exhibited elevated levels of these compounds in subsurface soil as well as tar staining and tar/NAPL at saturated levels.
- Review of historical and recent data for total BTEX/PAHs in groundwater in wells MW-07S and MW-08S, located on-site, indicates that since the initial monitoring, the concentrations of these chemicals have decreased significantly from elevated concentrations to less than 100 ug/l and 200 ug/l, respectively. This observation reflects that the source areas have weathered and are continuing to degrade. Total BTEX/PAH concentrations in the adjacent off-site areas have fluctuated over time, but exhibit no net increase. Concentrations of total PAHs in deep well MW-07D fluctuated sporadically since initial monitoring of this well. It is noted that NAPL was detected in deep subsurface soil at monitoring well MW-07D. Based on the trends observed, the groundwater at the site is considered to be in a steady state.
- A measurable layer of DNAPL was detected in on-site monitoring well MW-07D and off-site monitoring wells BMW-20D, BMW-21D and BMW-22D. The three off-site wells are located immediately downgradient of the Bay Shore site and are screened immediately above the Glacial/Magothy formation interface. DNAPL

thicknesses ranged from a minimum of 2.5 feet detected in MW-07D to a maximum of 7.0 feet detected in BMW-21D and BMW-22D. The four monitoring wells are located within the general area described above as containing a NAPL/tar-saturated soil zone at the Glacial/Magothy formation interface described above.

Qualitative Human Exposure Assessment

- The potentially exposed populations under current site conditions at the Bay Shore Site are on-site trespassers who may be exposed to surface soil via ingestion and dermal contact; on-site KeySpan workers who may be exposed to surface soil via ingestion and dermal contact, and inhalation of vapors in indoor air; and adult nearby off-site utility workers who may be exposed to site-related chemicals of potential concern (COPCs) in surface and subsurface soil via ingestion and dermal contact and groundwater via dermal contact. Potential exposures for nearby off-site utility workers are possible because of the presence of subsurface sewer, telephone, gas, water and railroad lines/facilities in the areas immediately adjacent to the site. Additionally, a portion of the residential area to the immediate south of the Bay Shore Site is included as part of the Bay Shore Site Operable Unit 1 (OU-1). The potential exposures for these off-site residents are discussed in **Section 5.4** below.
- Under potential future site use conditions, potentially exposed human populations include on-site and off-site construction workers and on-site adult commercial workers, adult and child visitors, and on-site adult and child residents. Exposure for the construction worker is possible because virtually any site redevelopment would involve some kind of construction activity. Potential on-site exposure media for the construction worker include surface soil (via ingestion and dermal contact), subsurface soil (via ingestion and dermal contact) and groundwater (via dermal contact).
- Because the Bay Shore Site is suited for commercial/light industrial redevelopment, exposures for adult commercial workers and adult and child visitors to future commercial properties are possible. Commercial worker and site visitor exposures are limited to indoor air because this is the exposure route most likely to occur, absent appropriate remediation, and present the greatest potential risk. It is expected that future land use of the on-site property may be deed restricted to prevent residential redevelopment; however, because deed restrictions are not yet in place, a future on-site residential scenario is included in this assessment. Potential on-site exposure media for these future on-site residents include surface and subsurface soil (via ingestion and dermal contact), groundwater (via dermal contact) and inhalation of vapors in indoor air.

5.2 Bay Shore West Parcel (Operable Unit 1)

Subsurface Soil

- Sampling conducted in the Bay Shore West Parcel identified an area of subsurface soil exhibiting BTEX with total BTEX concentrations ranging up to 495 mg/kg. Based on available data, this area is approximately 400 square feet in areal extent and appears to be centered at the locations of two former Oil Storage Tanks. This area of BTEX appears to be relatively shallow with concentrations of total BTEX not exceeding 0.1 mg/kg below a depth of 12 feet. NAPL/tar at saturated levels was not observed within the Bay Shore West Parcel with the exception of BBSB-69 located within the area exhibiting BTEX described above. In addition, shallow soil collected from several soil borings completed in this area exhibited NAPL/tar blebs and/or sheens. Similar to BTEX concentrations, these conditions were not observed below a depth of 12 feet.

Groundwater

- BTEX compounds were detected in shallow groundwater along the southern property boundary with total concentrations ranging up to 21,500.0 ug/l. Groundwater sample locations collected off-site and immediately downgradient of the Bay Shore West Parcel also exhibited total BTEX concentrations in shallow groundwater of between 353.0 ug/l and 4,500.0 ug/l. BTEX compounds were not detected above 81.0 ug/l in groundwater deeper than 26 feet bgs.
- PAHs were not detected above 732 ug/l in groundwater samples collected from the Bay Shore West Parcel.
- Historical trends of total BTEX/PAH concentrations in shallow groundwater in monitoring well MW-03S located on the Bay Shore West Parcel but east of the area of BTEX discussed above indicate that total BTEX concentrations have decreased to trace levels since September 1992 and total PAH concentrations have been detected at elevated levels since that time. However, it is noted that total BTEX and total PAHs in the recent sampling were detected at low concentrations. It is believed that the BTEX and PAHs observed in MW-03S are actually associated with source areas located on the southwestern portion of the Bay Shore site.
- Based on the southerly flow of groundwater and the location of sample points, the likely source of the BTEX present in shallow groundwater is subsurface soil located in the vicinity of the former Oil Tanks described above.

Qualitative Human Exposure Assessment

- Like the Bay Shore Site, the potentially exposed populations under current site conditions at the Bay Shore West Parcel are on-site trespassers who may be exposed to surface soil via ingestion and dermal contact; on-site KeySpan workers who may be exposed to surface soil via ingestion and dermal contact, and inhalation of vapors in indoor air; and adult nearby off-site utility workers who may be exposed to site-related COPCs in surface and subsurface soil via ingestion and dermal contact and groundwater via dermal contact. Potential exposures for nearby off-site utility workers are possible because of the presence of subsurface sewer, telephone, gas, water and railroad lines/facilities in the areas immediately adjacent to the site.
- Potential future use scenarios for the Bay Shore West Parcel are the same as those for the Bay Shore Site. Consequently, the potential exposure populations include construction workers, commercial workers and visitors to those commercial establishments, absent appropriate remediation. In the absence of deed restrictions precluding residential use, potential future on-site exposure populations include adult and child residents. The potential exposure pathways for these receptor populations are identical to those for the Bay Shore Site.

5.3 Bay Shore West Storage Lot (Operable Unit 3)

Surface Soil

- As part of the supplemental field program, two surface soil samples were collected from this parcel for analysis of PAHs. Total PAHs ranged from 15.8 mg/kg to 17.2 mg/kg. Based on the results of this data along with existing surface soil data, PAHs do not appear to be a concern in this portion of the study area.

Qualitative Human Exposure Assessment

- Potentially exposed human populations under current site conditions at the Bay Shore West Storage Lot Parcel include on-site trespassers and adult on-site KeySpan workers. On-site trespassers may be exposed to site-related COPCs in surface soil via ingestion and dermal contact. Potential exposures for the on-site KeySpan worker include surface soil (via ingestion and dermal contact) and inhalation of vapors in indoor air.
- Like the Bay Shore West Parcel, potential future use scenarios for the Bay Shore West Storage Lot Parcel are the same as those for the Bay Shore Site. Consequently, the potential exposure populations include construction workers, commercial workers and visitors to those commercial establishments, absent appropriate remediation. In the absence of deed restrictions precluding residential use, potential future on-site

exposure populations include adult and child residents. The potential exposure pathways for these receptor populations are identical to those for the Bay Shore Site.

5.4 Bay Shore Plume (Operable Units 1 and 2)

Groundwater

- Based on a south to southeast direction of groundwater flow, the sources of BTEX and PAH compounds in off-site groundwater appear to be primarily located within the central and southern portions of the Bay Shore Site. The Bay Shore West Parcel appears to be a minor contributor of these compounds to off-site groundwater.
- Although total BTEX and total PAHs were detected in groundwater samples collected from several downgradient wells and/or groundwater probe points, evidence of NAPL was not observed in any samples collected south of Union Boulevard. Based on this data, the Bay Shore Plume is comprised of dissolved-phase BTEX and PAH compounds downgradient of this location.
- The highest total BTEX concentrations in the off-site plume were detected in the shallow and intermediate zones of the Upper Glacial Aquifer at groundwater probes BBGP-07 and BBGP-75 located 450 and 800 feet, respectively, downgradient of the site. In addition, the highest total BTEX concentrations detected in the deep groundwater zone were also detected in groundwater samples from these probes. Unlike BTEX concentrations, some of the highest PAH concentrations detected within the Bay Shore plume were detected in the intermediate groundwater zone south of Montauk Highway, approximately 2,000 feet south of the site.
- The Bay Shore plume appears to be migrating in the direction of the natural flow of groundwater, south to southeast, extending from the Bay Shore Site to as far west as the southeast corner of the Bay Shore West Parcel: a width of approximately 500 feet. The total length of the plume is estimated to be approximately 3,400 feet with the plume discharging to Lawrence Creek, a tidally influenced surface water body located south of Montauk Highway. The discharge of the plume to Lawrence Creek is consistent with the findings of the Suffolk County Department of Health Services (SCDHS) Lawrence Creek Investigation discussed in the April 2002 RI report.
- Historical trends of total BTEX/PAH concentrations in groundwater in monitoring well clusters GM-03 and GM-05 indicate that over time, total BTEX/PAH concentrations have remained in a steady state at low levels in the middle portion of the plume (GM-03) and total BTEX have shown a net decrease to trace levels in the downgradient portions of the plume (GM-05). However, it is noted that concentrations of total PAHs in the downgradient portion of the plume have fluctuated sporadically since the initial monitoring of GM-05.

- BTEX and PAHs were detected in the deep groundwater zone of the Upper Glacial aquifer. However, the Upper Magothy formation consists primarily of low permeable clays. Due to the low permeable nature of this material, vertical migration of the Bay Shore Plume is restricted, and impact to the Magothy aquifer underlying the Upper Glacial aquifer is not expected. This is supported by the fact that BTEX and PAHs were found to be nondetectable in the most recent samples collected from BBMW-05D2 screened below the low permeable clay of the Magothy formation.
- The elevated concentrations of carbon dioxide and the almost complete absence of dissolved oxygen within the defined plume strongly support the conclusion that microbial respiration is occurring within the plume. Furthermore, it is likely that the BTEX and PAHs are being used as organic substrates by the microbes and are being metabolized.

Qualitative Human Exposure Assessment

- Current off-site residents living downgradient (generally due south) of the Bay Shore Site may be exposed to chemicals volatilizing out of the groundwater plumes passing underneath residential structures. Additionally, these residents may potentially be exposed to site-related chemicals in groundwater if they are using groundwater for domestic purposes. Relevant potential exposure pathways for such use of groundwater include ingestion, dermal contact, inhalation of volatiles while showering (if a private well is used as the source of the bathing water), and for irrigation purposes. Results of the indoor air sampling, and the well and basement survey (as summarized in **Section 2.5 of Appendix F**) have identified a very small number of properties at which the potential for indoor air exposure exists. The owners of these properties have been notified. Based on information collected to date, no active private wells have been identified within the confines of the Bay Shore Plume, i.e., within the limits of the plume as defined in the Remedial Investigation.

5.5 O-Co-Nee Pond (Operable Unit 3)

Groundwater

- The Brightwaters Yard plume consists of dissolved-phase BTEX and PAH compounds originating from a source area located in the southwest corner of the site. This source area is associated with a petroleum-based MGP feedstock historically stored at the Brightwaters Yard. The plume has been determined to be approximately 200 feet wide at the site boundary and approximately 1,400 feet long. KeySpan began actively treating the plume with an oxygen injection technology starting in September of 2000. As part of this remedial technology, a line of oxygen injection points were installed perpendicular to the plume along the southern shoulder of Union Boulevard.

- The review of quarterly BTEX and PAH groundwater data collected from monitoring wells located along the plume centerline indicates reductions in BTEX/PAH concentrations downgradient of the oxygen injection points. It is expected that these reductions will continue in the future and will propagate downgradient along with the natural flow of groundwater effectively treating the dissolved-phase plume.

Pore Water

- BTEX was detected in one of the six pore water samples that were collected and analyzed. Total BTEX was detected in sample BWPW-03 at a concentration of 177 ug/l and consisted almost entirely of benzene, which was detected at a concentration of 170 ug/l. Of the PAHs analyzed, only naphthalene was detected in pore water sample BWPW-02 at a concentration of 2 ug/l. No other PAHs were detected in any of the other pore water samples. The presence of BTEX in BWPW-03 is likely attributable to the discharge of the Brightwaters Yard plume to O-Co-Nee Pond.

Surface Water

- A total of 11 surface water samples were collected from O-Co-Nee Pond at six different locations. BTEX compounds were not detected in any of the surface water samples with the exception of xylene detected at a concentration of 1 ug/l at BWSW-01 (Bottom). PAHs were detected in two of the 11 surface water samples. Concentrations of total PAHs were 20 ug/l in sample BWSW-04 (Bottom +12 inches) and 34 ug/l in sample BWSW-05 (Bottom).
- Investigations conducted to date indicate the plume discharges to the lower portion of O-Co-Nee Pond. However, BTEX and PAHs were only detected sporadically and at trace concentrations in surface water samples collected from this area. This is attributable to:
 - mixing through dispersive forces and reduction of chemical mass through natural biodegradation processes.
 - groundwater containing BTEX and PAHs that may discharge to the pond is further diluted as the result of mixing with the surface water and other water sources discharging to the pond.
 - BTEX dissolved in surface water would have a propensity to volatilize from the water and undergo additional biological decay, resulting in further reduction of concentrations.

Surface Water Sediment

- Trace concentrations of xylene were detected in 5 of the 12 surface water sediment samples ranging from 0.002 mg/kg to 0.006 mg/kg. No other BTEX compounds were detected in any of the other surface water sediment samples. Concentrations of total PAHs, where detected in the sediment samples, ranged from 1.83 mg/kg to 56.9 mg/kg.
- The investigations conducted to date demonstrate that the Brightwaters Yard groundwater plume discharges to the lower portion of the O-Co-Nee Pond system. When comparing relative levels of contaminants in sediment samples collected from throughout the pond system, it is essential to also examine the location of the sediment and surface water samples relative to the plume discharge zone and to also compare the compounds detected in the sediment to those contained in the plume. The data shows, when examined in these contexts, that the PAH compounds detected in the headwaters of O-Co-Nee Pond are not associated with the plume. Specifically:
 - The available chemical data indicates that the suite of PAH compounds consistently detected in the Brightwaters Yard groundwater plume in the vicinity of O-Co-Nee Pond is distinctly different from the suite of PAH compounds detected in the sediment samples collected from the pond and the associated headwater areas.
 - The groundwater data collected as part of the 1997/1998 investigation of the Brightwaters Yard groundwater plume (refer to **Section 1.8** of the April 2002 RI report) indicates the plume is relatively narrow in the vicinity of Cooper Lane, being less than 80 feet wide at this location. As part of the 1997/1998 investigation, BTEX and PAHs were not detected in groundwater samples collected from groundwater probes and monitoring wells located between the defined Brightwaters Yard plume and the headwaters of O-Co-Nee Pond. Therefore, the plume does not appear to discharge to this portion of O-Co-Nee Pond. This 1997/1998 data was supported by the pore water sampling conducted as part of the supplemental investigation, where BTEX and PAHs were not detected in the headwater areas of O-Co-Nee Pond. However, pore water sample BWPW-03, collected from the lower portion of the O-Co-Nee Pond system and immediately downgradient of the projected plume path, exhibited a total BTEX concentration of 177 ug/l.
 - As the data presented on **Figure 4-39** clearly illustrates, the sediment samples exhibiting the highest total PAH concentrations, including BWSD-04 (0-0.5 feet), BWSD-05 (0.5 to 1.0 feet), BWSD-06 (0.5 to 1.0 feet) and BBSD-13 (0-0.5 feet), are all located in the headwaters area of O-Co-Nee Pond, which is not influenced by the Brightwaters Yard plume. Furthermore, the predominant PAHs detected in the sediment samples, including benzo(b)fluoranthene, fluoranthene and pyrene, are commonly associated with the incomplete combustion of fossil fuels. In addition, BTEX and PAH compounds are also commonly found in a wide range of products, including petroleum products such as gasoline and home heating oil.

Several petroleum spills have been documented by the NYSDEC as occurring within the vicinity of O-Co-Nee Pond. Therefore, it is reasonable to conclude that, aside from the Brightwaters Yard plume, there are other sources of these compounds in the vicinity of the pond.

In summary, the PAHs observed in the O-Co-Nee Pond system sediments cannot be attributed to the Brightwaters Yard plume because sediment samples exhibiting PAHs were not located in the area of O-Co-Nee Pond in which the Brightwaters Yard plume discharges and the PAHs detected are not consistent with those detected in the plume. Due to the ubiquitous presence of PAHs and BTEX in developed environments, a source other than the plume is plausible. That PAHs were not detected in all sediment samples does not negate this hypothesis.

Qualitative Human Exposure Assessment

- Potentially complete exposure pathways associated with O-Co-Nee Pond for off-site residents include ingestion and dermal contact with sediment and surface water. Additionally, the consumption of fish and crabs from O-Co-Nee Pond may occur. Potential exposure to site-related chemicals due to the consumption of fish and crabs from this surface water body is expected to be minimal because BTEX and PAHs generally were not detected or were detected at relatively low concentrations and the chemicals present in the surface water and sediment samples do not tend to bioconcentrate.

5.6 Watchogue Creek/Crum's Brook (Operable Unit 4)

Former Cesspool Area

- BTEX compounds were detected in subsurface soil with total BTEX concentrations of up to 8.4 mg/kg detected approximately 80 feet downgradient of the former Cesspool. The maximum total BTEX concentration observed during the initial field program of 9.6 mg/kg was also located downgradient of the former Cesspool. Consistent with the findings of the initial field program, BTEX compounds were only detected at concentrations greater than 1.0 mg/kg in shallow subsurface soil at depths no greater than 10 feet bgs. Below this depth, BTEX concentrations were found to be nondetectable or at trace concentrations not exceeding 0.05 mg/kg. The maximum total PAH concentrations detected in subsurface soil were observed in shallow subsurface soil within the vicinity of the former Knickerbocker Ice Company facility with total PAH concentrations of up to 1,354.1 mg/kg. Petroleum fingerprint analysis indicates that the hydrocarbons present in this area were most characteristic of diesel fuel and motor oil.

- BTEX and PAH groundwater data is generally consistent with soil data with the highest BTEX and PAH concentrations observed within the former Cesspool and immediately downgradient of this area in shallow groundwater. The maximum total BTEX and total PAH concentrations observed in this area were 911.0 ug/l and 3,015 ug/l, respectively. While the data does identify groundwater containing BTEX and PAH compounds immediately downgradient of the former Cesspool, concentrations decrease rapidly with increasing depth at most downgradient sample locations.

Former Pond Area and Watchogue Creek/Crum's Brook Headwaters

- Three soil borings were advanced in the former pond area in order to delineate the areal extent of BTEX/PAHs identified in this area as part of the initial field program. Total BTEX and PAHs did not exceed 0.25 mg/kg at all sample intervals selected for analysis. Based on this data as well as the extensive data collected as part of the initial field program, the highest BTEX and PAH concentrations in subsurface soil appear to be present in stream and pond sediments associated with the former pond area. These sediments are currently overlain by several feet of sand that was apparently used to fill in the pond. The sand used to backfill this area was found to exhibit little to no BTEX and PAHs.
- BTEX concentrations were below detection limits in 13 of the 15 groundwater samples. The remaining two samples exhibited total BTEX concentrations ranging from 5 ug/l to 16 ug/l. PAH compounds were detected in six of the 15 samples. Total PAH concentrations ranged from 22 ug/l to 740 ug/l. Based on these results, subsurface soil within the former pond appears to be a minor source of BTEX and PAH compounds to groundwater.

Qualitative Human Exposure Assessment

- Potential exposures along Watchogue Creek/Crum's Brook include the following populations: residents living in the vicinity of the former pond area and trespassers along Watchogue Creek south of Union Boulevard. Potential exposure media for these off-site residents and trespassers include surface soil (via ingestion, dermal contact, and inhalation) and potential exposure to surface water and sediment via ingestion and dermal contact. As part of an interim remedial measure (IRM), Watchogue Creek south of Union Boulevard has undergone restoration efforts, including the removal of shallow sediments and channel realignment.
- Under future land use conditions, off-site construction worker exposure to portions of Watchogue Creek/Crum's Brook may be possible. Potential exposure media and pathways for the off-site construction worker include surface soil (via ingestion and dermal contact), subsurface soil (via ingestion and dermal contact) and groundwater (via dermal contact).

Fish and Wildlife Resources Impact Analysis

- For purposes of the Fish and Wildlife Resources Impact Analysis (FWRIA) and consistent with NYSDEC guidance, the site and surrounding areas are considered as a whole given the transient nature of wildlife. Consequently, this section summarizes the general findings of the FWRIA and is not OU-specific. Following the Appendix 1C Decision Key in the NYSDEC's FWRIA document, a FWRIA was deemed required. The analysis focuses on risks associated with site-related chemicals detected in soil, surface water, sediment and groundwater. The complete FWRIA can be found in **Appendix F**.
- The site reconnaissance conducted as part of this analysis indicates that the site and surrounding area are poor quality environmental resources, due to the limited presence of vegetation. The site is partially covered with buildings, blue stone and asphalt. Wildlife species typically present are adapted to an urban setting. Due to the size of the vegetated areas, only a few individual animals will be present. Remediation is suggested to at least abate entry of the Bay Shore plume into Lawrence Creek and to prevent entry of the Brightwaters plume into O-Co-Nee Pond. Interim Remedial Measures (IRMs) that address the Brightwaters plume already are underway and remedial actions currently are being developed to address the Bay Shore plume.

5.7 Private Well and Basement Survey (Operable Units 2 and 3)

Indoor Air

- Air sampling was conducted at 16 off-site locations during the remedial investigation. At one location, two rounds of sampling were conducted and at another location, three rounds of sampling were conducted. A total of 67 samples were collected and each sample was analyzed for 61 volatile organic compounds. The majority of the volatile organic compounds for which analysis was performed were not detected. The majority of those compounds that were detected were detected at concentrations within the range of background levels as reported by the New York State Department of Health (NYSDOH) and those compounds detected above NYSDOH background levels are generally those not typically associated with MGP impacts. Additionally, naphthalene, the compound most commonly associated with potential MGP impacts, was not detected in any of the samples. The analytical results obtained were reviewed by the NYSDOH and the detected compounds were found to be at acceptable levels.
- NYSDOH background levels do not exist for some of the detected compounds. Detected concentrations of these compounds are orders of magnitude below occupational standards. Consequently, available indoor air data suggest that the

inhalation of vapors derived from site-related chemicals is not an exposure pathway of concern.

- Additionally, a basement survey was performed of properties within, between and in the immediate vicinity of the two groundwater plumes, as defined in the Remedial Investigation. Results of 145 questionnaires completed thus far indicate that an odor of potential concern, i.e., an odor that is characterized as “gasoline,” “oil,” or “driveway sealer,” is present at eight properties when the basement is wet. KeySpan has offered to follow-up with the eight homeowners who indicated the presence of an odor of potential concern. Due to the lack of precipitation in recent months, the basements at the properties were dry until recently. KeySpan has told property owners to contact the company if they experience the odor again, at which point KeySpan will schedule a property visit to determine whether further testing is warranted. Thus far, indoor air sampling has been performed at three properties. Additionally, a “gasoline” odor at one property has definitively been attributed to a neighbor’s gasoline tank. This survey information, coupled with results of the indoor air sampling performed to date, indicates that potential exposures to site-related chemicals via inhalation of indoor air in the vicinity of the site are minimal.

Private Well Water

- Seventeen of the 145 survey respondents reported the presence of a groundwater well on their property. KeySpan attempted to schedule visits for each of these. As a result, visits were conducted at 11 properties. The presence of a well could not be confirmed at 2 of the 11 properties due to access issues. At five properties, it was confirmed that a well is not present; one respondent who initially indicated the presence of a well later stated that the property does not have a well; and repeated attempts to arrange a site visit with four of the property owners have been unsuccessful. One respondent indicated that they have a well, but it is not functional.

The presence of a well was confirmed at four properties: one of these wells is in active use for irrigation purposes and three wells were confirmed to be inactive (i.e., not in use) for a period of several years. KeySpan attempted to sample all four wells. However, samples could only be collected from two of the four wells. One of the wells sampled was the active irrigation well located along Lanier Lane between O-Co-Nee Pond and the Bay Shore plume approximately 1,400 feet south of the site. The other well sampled was an inactive well located inside the approximate boundaries of the Brightwaters Yard plume approximately 950 feet south of the Brightwaters Yard. The other two wells could not be sampled due to access issues (i.e., piping setup).

Analytical results indicated that, with the exception of methyl tert-butyl ether, a common gasoline additive, no VOCs or SVOCs were detected in the sample collected from the active irrigation well. Several VOCs and SVOCs, including naphthalene, were detected in the inactive well. This well is not currently used as a source of water for any purpose and the pump is currently inoperable.

