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RACER TRUST
COLDWATER ROAD SITE UPDATE

January 28, 2020

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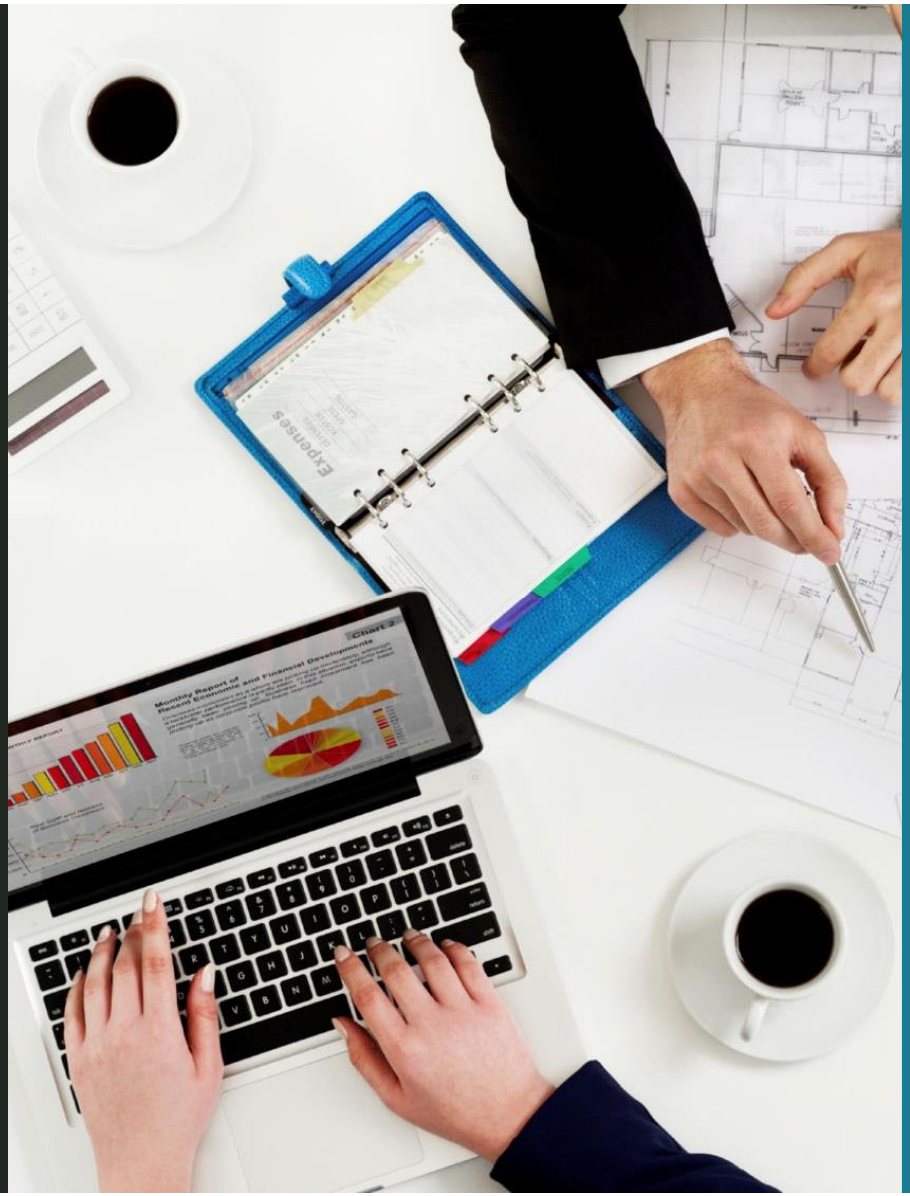
AGENDA



- Safety Moment
- Geology/Hydrogeology
- Investigations
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- PFAS Remediation/Corrective Measures
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- Path Forward

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SAFETY MOMENT

HOME OFFICE SAFETY

CARING TOGETHER

SAFETY MOMENT

What is it about?

If you work from home, you are working in a low-risk environment. But even if you do not recognize an immediate risk, **accidents can still happen**.

What does research say?

At least **25.3 million** unintentional injuries requiring medical attention occur every year at home across the USA*. Not all of these injuries are related to working from home, but let's try to reduce this number.

Source: * https://www.iii.org/fact-statistic/facts-statistics-homeowners-and-renters-insurance

What can you do when working from home?

Equipment

Check whether the temperature, ventilation, lighting, chair, desk, and computer are suitable for your work.

Breaks

Keep your day structured and take enough breaks for lunch and time to unwind to stay motivated and productive.

Power cables

Use cable ties to minimise numerous cables lying around in order to reduce the risk of fires and falls.

First aid kit

Ensure an easy access to your first aid supplies and keep it up-to-date.

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Geology/ Hydrogeology

- Glacial overburden at the Site consists of unconsolidated low permeability terminal moraine deposits (clayey tills) (10-7 cm/sec in-situ permeability tests, 10-8 cm/sec lab) interbedded with more permeable silt and sandy units to depths of 180 to 210 feet below grade (fbg) usually consisting of four units:
  - Discontinuous perched zone, comprised mainly of silty clays and silty sands to approximate depths of 35 to 40 fbg; however, some more continuous sand zones exist in the northeastern portion of the Site
  - Underlain by a confining unit comprised of clays with a thickness commonly 40-50 ft (with the bottom of clay to depths of ~75-85' fbg); however, the confining unit thins to the north of the landfill in the northeastern portion of the Site
  - Underlain by a [Glacial] drift aquifer consisting of sands and silty sands, 10-45 ft thick (with the bottom of sand to depth to 85-130 fbg)
  - Underlain by a lower confining unit comprised of clays with thicknesses approaching 100 ft (with the bottom of clay to depths of ~180-210 fbg), and in some locations containing an additional permeable zone at depth in close proximity to the bedrock.
  - Monitoring wells OBG MW-23 and OBG MW-27 and piezometer PZ-2 have been classified as Drift aquifer wells. It had been suspected that OBG MW-23 and PZ-2 were really Drift aquifer wells, but after the installation of OBG MW-27 it became apparent.

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Hydrology

- Three ponds exist within the northern portion of the Site and are ringed by wetland habitat. The ponds were created following property remediation and receive stormwater runoff from a significant portion of the northern property. They were generally constructed on the finished grades following excavation of sludges/soil from this area (*i.e.*, were constructed on the generally clayey soils making up the substrate across much of the Site).

Pond ID	**Eastern**	**Middle**	**Western**
Surface Water Level (1/28/19) (ft MSL)	784.8	784.8	771.1
Surface Water Level (4/22/19) (ft MSL) (November/December 2019 data is similar to these earlier data)	785.1	785.1	771.8
Typical Maximum Depths (ft)	4 to 6	6 to 10	4 to 6
Max. Base Elevation (ft MSL)	779.3	774.7	765.6
Associated Piezometer	PZ-1	PZ-3	PZ-2
Depth to Groundwater (ft)	12 to 13	2 to 3	22 to 24 (shallower to the west)
Groundwater Elev. (1/28/19) (ft MSL)	771.94(PZ-1)	781.46(PZ-3)	747.42 (PZ-2)
Groundwater Elev. (5/28/19) (ft MSL)	772.66	782.74	749.32
Groundwater Elev. (11/20/19) (ft MSL)	773.59	782.01	748.07 (768.60 at OBG MW-26)

- The groundwater levels in the area of the ponds indicate that the eastern and middle ponds may receive some infiltration from the shallowest saturated seams in the perched zone, but are more likely contributing to the recharge of the perched zone. The western pond is likely only recharging the perched zone.

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PFAS Investigations

- November – Additional bottom soil characterization.
  - Collected additional bottom soil samples at seven borings (SD-7A, SD-7-SE, SD-7-NW, SD-9A, SD-9-E, SD-9-N, and SD-9W) within the middle (SD-7 series) and western (SD-9 series) ponds to characterize and evaluate the variability, including vertically, of the bottom soil adjacent to original bottom soil locations SD-7 and SD-9. One additional deeper sample at 3 fbg was collected adjacent to the original locations of SD-7 and SD-9 to evaluate the vertical distribution of PFAS with depth. In addition, borings were conducted approximately 50 feet from the original sampling locations along the shore orientation and landward to help delineate impacts in the area both horizontally and vertically. Samples were collected at 0 – 0.5 fbg and at 3 fbg at each of the move out locations. In the SD-7 area the landward borings (SBP-63 and SBP-64) were conducted in conjunction with delineating the impacts observed at SBG-5 and samples were collected at 0 – 0.5 fbg and at 2.5 fbg. SBP-63 was installed approximately 50 ft east by northeast of SD-7-NW and and SBP-64 was installed about 50 ft east of SD-7. Vertical soil profile samples were collected from the bottom soil sample locations previously collected (SD-1 though SD-3). Two additional samples were collected from one foot and three foot below the bottom of the ponds to obtain a profile of PFAS impacts with depth.
- October/November 2019 – Additional Borrow soil area characterization.
  - Ten Geoprobe® borings (SBG-5A, SBG-6A, SBG-8A, SBG-10A, SBG-15, SBG-16, SBP-62, SBP-63, SBP-64, and SBP-65) were installed northeast of the middle pond to characterize and evaluate the suitability of using on-site soil for increasing the elevation of the existing berm, and to delineate PFAS impacts identified in the SBG-5 area. Soil samples were collected and analyzed for PFAS; a 0 - 0.5 fbg and 2.5 fbg sample was collected from each location.

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PFAS Investigations

- October/November 2019 – Conducted additional perched zone PFAS characterization.
  - Installed eight temporary wells (three additional locations were dry) for collection of perched zone groundwater samples to delineate groundwater:
    - West (SBP-38GW) and south (SBP-40) of OBG MW-26. SBP-39 and SBP-39A located southwest of OBG MW-26 were dry
    - Southwest (SBP-55 and SBP-56) and northwest (SBP-58 and SBP-59) of SBP-6. SBP-57 located southwest of SBP-56 was dry
    - West (SBP-60) and north (SBP-61) of SBP-29.
- October/November 2019 – Conducted additional Drift aquifer PFAS characterization.
  - Installed an additional Drift aquifer monitoring well (OBG MW-27) adjacent to OBG MW-26. The intent was to install a deeper well adjacent to OBG MW-26 in the next deeper water bearing zone, which happened to be the Drift aquifer.
- January 2020 – Resampled OBG MW-27 after purging 50+ gallons of water from the well to evaluate whether cross-contamination occurred during well installation.
- December 2019 – Conducted quarterly residential well and raw groundwater sampling at 1278 E. Stanley Road and semiannual residential well sampling at 1217 and 1320 E. Stanley Road
- November 2019 – Additional stormwater characterization.
  - Storm sewer samples were collected from manholes MH-17A, MH-18, and SS-03 to further evaluate the presence of PFAS in stormwater in the southwest area of the Site.

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PFAS Investigations

- November 2019 – Sanitary sewer characterization.
  - Five sanitary sewer samples were collected from manholes north and northwest of OBG MW-12S located along Stanley Road (SAN-1 and SAN-2), and along Dunkirk (SAN-3), Hartman (SAN-4), and Temple (SAN-5) roads to evaluate the presence of PFAS in sanitary sewer water adjacent to the Site.
- October/November 2019 – Additional PFAS soil hot spot characterization.
  - Installed five Geoprobe® soil borings (SBP-8A and SBP 51 through SBP-54) located adjacent to SPB-8 and then east, south, west, and north of SBP-8, respectively and collected soil samples to delineate horizontally and vertically impacts identified in the SBP-8/OBG MW-17S area.
  - Installed three soil borings (SBP-12A, SBP-47, and SBP-48) located adjacent to SBP-12 and west along the Site fence and south of SBP-12 within and adjacent to the former remaining materials area (RMA) and former sludge drying bed area.
  - Installed three soil borings (SBP-13A, SBP-49 and SBP-50) located adjacent to SBP-13 and north and south of SBP-13 along the western Site fence west of the former RMA.
  - Installed two soil borings (SBP-16A and SBP-44) adjacent to SBP-16 and south of SBP-16 south of the former sludge drying bed area.

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PFAS Investigations

- October/November 2019 – Additional PFAS soil hot spot characterization (continued).
  - Installed three soil borings (SBP-17A, SBP-45, and SBP-46) adjacent to SBP-17 and north and southwest of SBP-17 within the former sludge drying bed area.
  - One soil boring (SBP-18A) was intended to be installed adjacent to SBP-18; however, it was mistakenly placed next to SBG-1. However, SBP-18 area was also under water due to rise in water level of the Middle pond.
  - Installed four soil borings (SBP-19A, SBP-41, SBP-42, and SBP-43) adjacent to SBP-19 and northwest, southwest, and further south of SBP-19 near the Site fence within and south of the former sludge drying bed area.
  - To further evaluate the residual PFAS impacts (both horizontally and vertically) adjacent to the abandoned railroad adjacent to SBP-32 and SBP-37, which where identified as potential hot spots, at total of six soil borings were installed. Samples were collected at 0-0.5 fbg, 1 fbg, and 3 fbg approximately 50 feet north (SBP-32-N and SBP-37-N) and south (SBP-32-S and SBP-37-S) of each of the original sampling locations, and at 1 fbg and 3 fbg adjacent to the original sampling location (*i.e.*, SBP-32A and SPB-37A) .

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PFAS Interim Corrective Measures

- September 2019 - Submitted JPA for stormwater management modifications to raise the berm height on the Middle pond to an elevation of 791.5 ft MSL (emergency spillway at 790 ft MSL) for EGLE review per dam safety regulations.
- September 2019 - Additional PFAS interim measures - Manhole MH-11 was plugged to mitigate the hydraulic head on plug at MH-14 and help stabilize hydraulic head within the western railroad spur area.
- December 2019 – The locations of Manholes MH-12 and MH-13 were surveyed in so that they can be located and plugged on December 23, 2019 to further help stabilize hydraulic head within the western railroad spur area.

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Key PFAS Results

- The landfill is performing in accordance with design standards and does not appear to be releasing PFAS to the subsurface.
- Water draining off-site to the west through a 72-inch storm sewer was found to contain PFOS above its Surface Water Quality Standard (12 ng/l). The discharge has been almost entirely stopped after the plugging and pressure grouting activities under taken in June 2019.
- All three ponds have detectable concentrations of PFOS that exceed the Surface Water Quality Standard; however, with the recent completion of the berms in the western and middle pond areas discharge of water from the ponds into storm sewers has been greatly reduced.
- The base of the ponds were clayey soil and do not appear to be sediment per se. PFOS concentrations identified in these samples were above the GSI protection criteria of (240 ng/kg). However, these concentrations may be residual from former landfarming operations as evident by similar or increasing PFOS concentrations with depth at SD-2, SD-9/9A, and SD-9E (west pond) and SD-3, SD-7-SE, and SD-7-NW (middle pond). It appears that the eastern pond area may have been excavated to beneath the residual PFAS impacts during the remediation of the Site.
- Stormwater modeling results indicate that by raising the berm along the western and southern sides of the middle pond stormwater can be maintained on-site without water discharging from to or from the western pond.

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Key PFAS Results

- Total of 15 residential wells sampled and three wells with PFAS detections; one (1278 E. Stanley Road) above the PFOS Drinking Water Cleanup Criteria (water in the area is primarily obtained from bedrock over 200 fbg).
- The quarterly or semiannual residential well results were non-detect at 1217 E. Stanley Road and in the treated water (collected at the kitchen sink) at 1278 E. Stanley, and the well water at 1320 E. Stanley Road detected PFOS at a concentration of 6 ng/l, which is consistent with previous results. The raw water at 1278 E. Stanley detected PFOS at 42 ng/l, which is consistent with previous results and PFHxS was detected at 3 ng/l.
- Only trace (<2 ng/l) levels of PFAS detected within the Drift aquifer, with the exception of OBG MW-27 located on the west side of the Site adjacent to OBG MW-26, which had several detections of PFAS constituents that were below the drinking water standard (at concentrations of 12 ng/l of PFOA and 25 ng/l of PFOS). OBG MW-27 was resampled on January 16, 2020 – results are pending.
- Detections in B-2D attributed to failed well casing at about 40 fbg (there was a “kink” in the well at this depth) allowed perched zone impacts to enter this well. B-2D was abandoned in December 2018, and OBG MW-16D was installed as a replacement well less than 30 feet away. PFAS has been non-detect in OBG MW-16D during the October 2018 and June 2019 sampling events.
- PFAS groundwater impacts above 12 ng/L PFOS do not appear to have migrated far from the primary source areas, but may extend off-site up to approximately 400 feet to the west and approximately 200 feet to the northwest of OBG MW-12S, which is located in the northeast corner of the Site. PFAS does not appear to be migrating off-site in other areas.
- Three apparent hot spots with PFOS/PFOA concentrations greater than 1,500 ng/l have been identified corresponding to sampling locations HPT-10, HPT-14/OBG MW-22, and SBP-1-GW/OBG MW-8, which are associated with the former sludge drying bed area, the former remaining material area (RMA), and the former WWTP area, respectively. However, permanent perched well OBG MW-20 installed at the location of HPT-10 has been dry since it was installed, confirming that the water observed at HPT-10 at 25 fbg was likely infiltrating pore water rather than true groundwater.

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Key PFAS Results

- Two additional areas with PFOS/PFOA concentrations greater than or approaching 500 ng/l have been identified, including one located east and north of the former landfarming area (sampling locations HPT-02/HPT-13, and associated PFAS detections in monitoring wells OBG MW-12S and MW-17S), and one located southwest of the western pond at monitoring well OBG MW-26. Two temporary monitoring well samples to the northwest and southwest of OBG MW-12S had detections of PFOS of 360 ng/L (SBP-6) and 310 ng/L (SBP-29); however, temporary monitoring well samples collected from SBP-56, SBP-58, and SBP-59 located approximately 200 feet southwest, 200 ft northwest, and 400 ft west-northwest, respectively of SBP-6 delineated the impacts to below the drinking water standard, as did the samples collected from SBP-60 and SBP-61 located approximately 100 feet west and north, respectively of SBP-29.
- The temporary well sample collected from SPB-38GW located west of OBG MW-26 contained PFOS at a concentration of 280 ng/l (PFOA was non-detect).
- The only permanent perched zone monitoring wells with PFAS above EGLE's drinking water criteria are wells: B-7, OBG MW-8, OBG MW-11, OBG MW-12S, OBG MW-14, OBG MW-17S, OBG MW-22, OBG MW-26, and PZ-3.
- PFOS was detected in the VAS (*i.e.*, temporary well screening) sample from 63 fbg at 9.3 ng/l during drilling of the replacement well at 1278 E. Stanley Road. The sample from 84 fbg was non-detect.

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Key PFAS Results

- Soil sampling results:
  - Adjacent to abandon B-2D and OBG MW-17S areas (SBP-7 – SBP-9, SBP-8A, and SBP-51 through SBP-54) – detected PFOS above the EGLE GSIP cleanup criteria (240 ng/kg) in 14 of the 16 samples collected at these eight sample locations. PFOS detections ranged from 1,000 ng/kg at SBP-9 (5 fbg) to 140,000 ng/kg at SBP-8A (2.5 fbg). The PFAS detection in SBP-8/8A indicates a "hot spot" that was not previously remediated. The sample from SBP-9 at 10 fbg vertically delineated PFAS detections to below the criteria at this location.
  - RMA (SBP-10 – SBP-13, SBP-12A, SBP-13A, SBP-47, SBP-48, SBP-49, and SBP-50) – detected PFOS above the EGLE GSIP cleanup criteria in 14 of the 19 samples collected at these 10 locations. PFOS detections ranged from 3,200 ng/kg at SBP-47 (0.5 fbg) to 38,000 ng/kg at SBP-12A (4 fbg). PFAS were not detected or detected at low concentrations at SBP-10 (10.5 fbg), SBP-11 (12.4 fbg), SBP-13 (8.3 fbg), and SBP-47 (4 fbg and 8 fbg). The samples from SBP-13 at 8.3 fbg and SBP-47 at 4 fbg and 8 fbg vertically delineated PFAS at this location. These concentration represent the residual impacts following the removal of more highly impacted soil within this area.
  - Former sludge drying beds (SBP-14 – SBP-19, SBP-16A, SBP-17, SBP-18A, SBP-19A, SBP-41 through SBP-46) – detected PFOS above the EGLE GSIP cleanup criteria in 31 of the 33 samples collected at these 16 locations (all but SBP-14). PFOS detections ranged from 1,400 ng/kg at SBP-44 (3.5 fbg) to 76,000 ng/kg at SBP-45-3.5 (3.5 fbg), which represent residual impacts following the removal of the former sludge drying beds. Because the sludge drying beds were constructed above the native ground surface, less excavation of native soils were conducted in this area than in areas such as the RMA to remove the former metals impacts.
  - Adjacent to manhole MH-18A (SBP-20) – detected PFOS above the EGLE GSIP cleanup criteria in the SBP-20 surface (0 to 0.5 fbg) soil sample (3,800 ng/kg) and the 5 fbg sample (6,300 ng/kg) collected at this location.

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Key PFAS Results

- Soil sampling results (continued):
  - Former plating areas (SBP-21 – SBP-24) – detected PFOS above the EGLE GSIP cleanup criteria in three of the four sample locations (all but SBP-21). PFOS detections ranged from 810 ng/kg at SBP-24 (10 fbg) to 9,400 ng/kg at SBP-22 (14.5 fbg)
  - Southern area near Coldwater Road (SBP-25 – SBP-28) – PFOS was not detected above the EGLE GSIP cleanup criteria in the four sample locations.
  - Abandon railroads (SBP-32 – SBP-38, SBP-32A, SBP-32-N, SBP-32-S, SBP-37A, SBP-37-N, and SBP-37-S) – detected PFOS above the EGLE GSIP cleanup criteria in each of the 11 surface (0 to 0.5 fbg) sample locations and in seven of the 12 deeper (*i.e.*, 1 fbg or 3 fbg) samples; however, the PFOS impacts were delineated vertically in SBP-32A at 3 fbg, SBP-32-N at 1 fbg and 3 fbg, and SBP-32-S at 1 fbg and 3 fbg. PFOS detections ranged from 380 ng/kg at SBP-32-N (0.5 fbg) to 70,000 ng/kg at SBP-37. The concentrations at SBP-37 indicate a “hot spot” within this area of the former railroad spur. Based on metals concentrations, remediation was not previously required within the railroad spur.

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Key PFAS Results

- Geotechnical Borings northeast of middle pond (SBG-5, SBG-7, SBG-9, SBG-11, SBG-13, SBG-5A, SBG-6A, SBG-8A, SBG-10A, SBG-15, SBG-16, and SBP-62 through SBP-65) – detected PFOS above the EGLE GSIP cleanup criteria at 18 of the 30 samples collected at these 15 sample locations. PFOS detections ranged from 280 ng/kg at SBG-7 (1 fbg) to 65,000 ng/kg at SBG-5A (0.5 fbg). However, the 2.5 or 5 fbg samples at SBG-5, SBG-7, SBG-9, SBG-11, SBG-6A, SBG-8A, SBG-10A, SBG-15, SBG-16, and SBP-63 were either non-detect or below the cleanup criteria. The 2.5 fbg or 5 fbg samples at SBG-13, SBG-5A, and SBP-62, SBP-64, and SBP-65 had elevated PFOS detections. Based on these results the soil within the area outlined by SBG-7 and the eastern half of the borrow area evaluated is suitable for berm construction. The samples in the SBP-5 area appear to represent another "hot spot" not removed during previous remedial activities. Therefore, it appears if the first foot of soil was removed from the remaining areas (as discussed above) that the remaining deeper soils would be suitable for use to build the berm along the Middle pond. If 2.6 feet of clayey soil is removed from the approximate proposed borrow area shown in the figure in the next slide, which is approximately 3.7 acres, then sufficient soil will be produced to provide the approximately 15,000 cubic yards of material needed for the new Middle Pond berm construction.
- In addition to the available on-Site borrow soils, borrow soil from a nearby road construction project provided approximately 12,000 cubic yards of soil that have been stockpiled on the Site for potential use during berm or other site construction activities. Incremental sampling was conducted on these soil and a single Decision Unit (DU-01) was determined to be appropriate for the soil and a PFAS sample was analyzed and the only PFAS detected were PFOA at a concentration of 15 ng/kg and PFOS at a concentration of 26 ng/kg, which is suitable for use at the Site. A second set of incremental samples were collected from additional borrow soils associated with another area of nearby road construction. The results for the second area are being summarized.

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Proposed Borrow Area and Soil Stockpile Area Map

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Key Berm Construction Testing Results

- The soil characterization for berm construction:
  - Two samples (8 total) for grain size analysis with hydrometer, Atterberg limits, USCS classification, and moisture content were analyzed for each of the four 30-foot deep geotechnical borings (SBG-1 through SBG-4) installed along the existing middle pond berm to evaluate the stability of the existing berm. The results indicate that the existing berm soils are classified as CL or CL-ML (clay) with fines (silt and clay) contents between 56 and 66.8%, moisture contents between 11 and 16% with plasticity indexes ranging from 5 to 17. The results of the slope stability analysis indicate that the proposed new embankment at middle pond meets the stability criteria for all of the recommend loading conditions. Furthermore, settlement induced by the new embankment is anticipated to be minimal (<3 inches), even with conservative soil parameters.
  - Nine grab samples and a bulk sample for grain size analysis with hydrometer, Atterberg limits, USCS classification, and moisture content were analyzed from clayey soils from selected locations from the 10 geotechnical borings (SBG-5 through SBG-14) conducted in the potential borrow soil area located northeast of the middle pond to evaluate their suitability for use in the new middle pond berm construction activities. The results indicate that the borrow soils are classified as CL or CL-ML with fines contents between 61.2 and 87.1%, moisture contents between 9.1 and 17.1% with plasticity indexes ranging from 6 to 9. Therefore, the proposed borrow soils are considered suitable for construction of the new embankment for the middle pond berm.
  - The standard Proctor test (ASTM D698) results indicate that the optimum moisture content for compaction is 13.1% and yielded a maximum density of 125.2 pounds per cubic foot (pcf).
  - Four geotechnical samples were collected for grain size analysis with hydrometer, Atterberg limits, USCS classification, and moisture content from the off-site road construction project soil. The results indicate that the off-site soils are classified as CL (clay) with fines (silt and clay) contents between 67.9 and 82.1, moisture contents between 15 and 22% with plasticity indexes ranging from 11 to 16. Therefore, the off-site borrow soils are considered suitable for construction of the new embankment for the middle pond berm. The standard Proctor test (ASTM D698) results for the off-site borrow soil indicate that the optimum moisture content for compaction is 13.8% for the first proctor sample with a maximum density of 116.3 pcf and 14.8% and 112.8 pcf for the second proctor sample. Other non-PFAS chemical results indicate that the off-site soils are suitable for reuse from an environmentally.

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Key Observations

- Storm Sewer Burial Depth vs. Groundwater Elevation Evaluation:
  - The 72” storm sewer on Site is generally below the groundwater table (at least for the shallowest water bearing zones of the perched zone); however, about half way between MH-15 and MH-16 the sewer is above the groundwater table.
  - Storm sewers off site appear to be above the groundwater table.
  - Following the plugging of MH-15 in June, the flow at MH-17A is minimal and has reduced over time. On August 21, 2019 it was very difficult to see if the <1/2 inch of water in the 72” sewer was moving or just ponded, some minimal flow was observed from George Street storm sewer into 72” Sewer.
- Sanitary Sewer Burial Depth vs. Groundwater Elevation Evaluation:
  - The 6” PVC sanitary sewer servicing the Site building is generally above the water table. It may be close to the water table at the border of the Site just before it joins the off-site sanitary sewer
  - Sanitary sewers off site generally appear to be above the groundwater table, except for the eastern 100 to 150 feet of the sanitary sewers along Morris Hills Parkway, Temple Avenue, and Hartman Street; the eastern 400 feet of the sanitary sewer along Dunkirk, and the sanitary sewer along E. Stanley Road north of OBG MW-12S/D

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Abbreviated Conceptual Site Model

- The Site was remediated, primarily based on metal impacts, to remove the original (primary) source materials in the 1990s.
- Approximately 800,000 tons of sludges and soil were removed from the Site.
- Excavation depths of over 20 feet in some areas removed the primary source materials. However, during the possibly 30 to 40 years that PFAS may have been utilized at the Site, PFAS-impacted water infiltrated, adsorbed, and diffused into the predominantly clayey soils below the former waste water treatment operations, and thus impacted primarily perched groundwater and created a residual or secondary source for PFAS impacts. In addition, some unknown impacts (either residual or not) may have been left in areas either previously remediated for metals or previously considered unimpacted due to low metal concentrations.
- This secondary source has and continues to impact groundwater, storm sewers, and pond water from back diffusion or desorption over the years and will likely continue to do so.
- Given the number of years since the primary source material was removed from the Site, it is likely that the extent of impacts currently delineated at the Site were under steady state or declining concentrations conditions. Recent modifications to the Site hydrology could result in changing conditions.

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Path Forward

- Raise the berm around the middle pond to contain a 200-year (or consecutive 100-year) storm event(s).
- Increase western berm one foot as extra level of safety.
- Complete delineation of perched zone groundwater along northern western edge of the Site along Saginaw Street.
- Collect additional storm water and sanitary sewer samples to evaluate PFAS impacts and risks associated with these pathways.
- Seal bulkhead at manhole MH-16 to stop the now minor flow around the plug at this location.
- Monitor groundwater and storm water.
- Further refine CSM and evaluate potential exposure pathways as additional data is obtained to determine what additional work is necessary.
- Develop an updated annual PFAS monitoring plan.

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Additional Investigations

- Delineate shallow perched zone groundwater in the area of SBP-38 using temporary wells, one location north of SBP-38 and the Dollar General property along the western edge of the Site, and three other locations west, northwest, and southwest of SBP-38 on the west side of Saginaw Street within the right of way (ROW).
- Install one permanent well OBG MW-28 at SBP-61 to act as a sentinel well north of the Site.
- Evaluate OBG MW-27 resample data to evaluate whether additional Drift aquifer investigation work is necessary.
- Collect 6 additional storm sewer water samples to evaluate if PFAS impacts exist within the storm sewers along Saginaw Street and to confirm that PFAS does not exist within storm water west of the Site (*i.e.*, resample SS-03 south of manhole MH-17A).
- Collect 15 additional sanitary sewer samples to further evaluate PFAS impacts, if any, within the sanitary sewers north and west of the Site and to evaluate downstream and upstream (background) concentration, if any.
- Collect additional information on the sanitary and storm sewers west and south of the site (Peregrine parking area and along Coldwater Road)

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Thank you!