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MONITORING PLAN
FOR
CONSTRUCTION DREDGING AND DREDGED SLURRY

PORT OF WILMINGTON
EDGEMOOR EXPANSION
EDGEMOOR, NEW CASTLE COUNTY, DELAWARE

Revised August 2021

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1. Introduction

Diamond State Port Corporation (DSPC) of Delaware has applied to the United States Army Corps of Engineers (USACE) for a Clean Water Act Section 404 permit, and a Rivers and Harbors Act Section 10 permit (Application CENAP-OR-R-2019-278) and a State of Delaware Department of Natural Resources and Environmental Control (DNREC) Subaqueous Permit (Application No 2020-P-MULTI-0024) for dredging related to the construction of a primary harbor access channel and ship berth development ("proposed project") at the applicant's Edgemoor property ("Edgemoor Site"). The proposed project supports the redevelopment of the Edgemoor Site into a multi-user containerized cargo port.

The proposed project is located adjacent to and north of the Federal navigation channel, in the southern portion of Reach B of the Delaware River, at the intersection of the Cherry Island and Bellevue Ranges and is offshore of the applicant's property located along Hay Road, in Edgemoor, Delaware. The applicant proposes to deepen portions of the Delaware River adjacent to the Federal Navigation Channel to create a primary access channel that will serve the proposed berth construction at the Edgemoor Site.

The primary harbor access channel will provide access to an approximately 2,600 foot long wharf structure. Proposed construction of the berth and access channel calls for excavation to a 45-foot mean lower low water (MLLW) project depth. The 45-foot MLLW project depth matches the maintained depth of the Federal navigation channel of the Delaware River. The area expected to be dredged is approximately 4000 feet in length and a width extending from the boundary of the federal navigation channel to approximately 300 feet offshore of the site at MLLW. The total area is approximately 85 acres, and is estimated to require the dredging of 3,325,000 cubic yards as part of the construction. The harbor layout and berth grading are shown in project permit drawings titled "Port of Wilmington – Edgemoor Expansion, Permit Plans" prepared by Duffield Associates, LLC (Duffield) dated October, 2019, Revised June 2021. The dredging for the construction of the harbor is proposed to occur over three dredge cycles, and the dredged material from those cycles is proposed to be placed into existing USACE Confined Dredge Facilities (CDF) and an onsite CDF facility. The primary dredged material disposal area is the Wilmington Harbor South Disposal Area (WHSDA) and Wilmington Harbor North Disposal Area (WHNDA) has been identified as a contingent disposal area. Dredge estimations performed by USACE have indicated that active dredge duration for the first dredge cycles is 3.2 months, the second dredge cycle is 3.7 months and the third dredge cycle is 2.0 months.

The permit applications include a report titled, Wilmington Harbor, Edgemoor Expansion, and Environmental Assessment Technical Document." Appendix 20 included a report titled "Sediment and Surface Water Quality Assessment, Proposed Berth and Approach Channel, Edgemoor, Delaware," dated June 2020, revised

June 21, 2021 (SSWQA Report). The SSWQA Report assessed sediment and water quality in terms of human health and ecological risks associated with the dredging of sediments from the Delaware River at Edgemoor. In that assessment, Edgemoor sediments were categorized into three strata (A, B and C) based on the physical characteristics of the sediments. The assessment provided predictions of water quality both near the point of active dredging and in the effluent returning to the Delaware River based on the analytical testing performed on water and sediment samples collected at the site. These predictions indicated that an average total suspended sediment (TSS) concentration less than 3,000 mg/L, with instantaneous TSS concentrations not exceeding 4,000 mg/L in the CDF effluent would meet regulatory standards. Point of dredging calculations were based on a TSS concentration of 250 mg/L 200 feet down-current of the cutterhead based on the direction of DNREC based on established levels on the Delaware River.

This Monitoring Plan (MP) has been prepared to describe the monitoring that is proposed to be performed during the construction dredging for the purposes of validating the conclusion of the permit documents and documenting compliance with the permit conditions in the USACE and DNREC permits. This monitoring is proposed to include three locations:

- Point of dredging;
- Effluent at the CDF (inflow and discharge); and
- Background in the Delaware River.

The monitoring will include collection and analytical testing of both sediment and water samples as described in this MP.

2. Water Quality Monitoring at the Point of Dredging

The hydraulic dredging has potential to increase turbidity in the river around the cutterhead due to the rotation of the cutterhead causing dredged sediment particles to become suspended in the river water. While the majority of these sediments will be collected in the slurry discharged in the CDF, small amounts of the sediments have the potential to be released into the water column. In order to assess the impact of the cutterhead operation on the water quality in the river water, turbidity and laboratory analyses in the Delaware River near the dredge cutterhead, up-current from the cutterhead, and down-current from the cutterhead will be monitored during active dredging.

Existing turbidity studies performed by USACE and reviewed by DNREC have established a relationship between turbidity monitoring and TSS to permit the monitoring of turbidity to be used to assess the permissible TSS concentration of 250 mg/L at a location 200 feet down-current of the cutterhead. During the Delaware River Main Channel Deepening Project within both Reach B and Reach C, a linear regression equation was developed based on 87 paired samples and 157 paired samples, respectively which correlates to 9,000 turbidity measurements and 16,000 turbidity measurements, respectively. This information was summarized in reports titled, “Final, Delaware River Lower Reach B Main Channel Deepening Project, Pedricktown South Confined Disposal Facility Monitoring and Water Quality Monitoring at the Point of Dredging,” prepared by Versar, Inc., dated October 2012 and “Delaware River Reach C Main Channel Deepening Project, Killcohook (Cells 2 and 3) Confined Disposal Facility Monitoring and Water Quality Monitoring at the Point of Dredging,” prepared by Versar, Inc., dated November 2011. The Reach B analysis determined that a turbidity reading of 160 NTU or less met the 250 mg/L TSS water quality performance standard 200 feet down-current from the cutterhead while the Reach C analysis determined that a turbidity of 170 NTU or less met the same standard at the same distance. Reach B includes the area of the Wilmington Harbor – Edgemoor Expansion Project and Reach C is located down-river from the Edgemoor site in an area with similar environmental conditions. Due to the similarities in linear regression results for the two studies, the relationship between TSS and turbidity established by these studies will be used as a basis for relating turbidity values to TSS concentrations during dredging for the Edgemoor Expansion Project.

Sample locations are proposed to be collected five feet from the bottom of the area being dredged since that is where suspended solids concentrations are anticipated to be highest based on the results of data collected at shallow, mid-depth, and deep locations during dredge monitoring for the Main Channel Deepening Project in Reach B of the Delaware River.

2.1 Water Column Characteristics Monitoring

Turbidity readings in nephelometric turbidity units (NTU) will be collected on a continuous basis approximately 200 feet from the cutterhead as well as other water column characteristic data including temperature, salinity, dissolved oxygen, and pH during construction dredging. Additionally, background monitoring locations for measuring ambient turbidity will be established approximately 1 mile up-river and approximately 1 mile down-river from the center of the project site. The up-current sample will serve to represent background water column conditions at the time of sampling. The near cutterhead and down-current samples will serve to assess conditions being caused by dredging and the change in those conditions with distance from the active work site. Figures 1 and 2 show the sampling locations.

A background monitoring point will also be located in the Cherry Island Flats near the project site per the request of DNREC Division of Fish and Wildlife at the location shown in Figure 1 in order to assess potential dredging-related changes to turbidity in that sensitive aquatic environment. The monitoring will be performed using a sonde device in one fixed location and set at a depth approximately 5 feet above the bottom of the river at the monitoring location (see Figure 1). The background sondes will be deployed to begin monitoring 1 week prior to the start of each active dredging period and will continue until each active dredging period ends.

The monitoring will be done using instruments (sondes) equipment with automated data recording. Monitoring at the active dredge site must account for the extreme differences in water depths that will be encountered during dredging (low tide line to 45 feet below mean low water) as well as to account for tidal fluctuations and movement of the dredge. The plan is to deploy the background sondes to collect data at approximately 5 feet above the river bottom at mean low tide, which given the approximate 4.5 feet of tidal range, should yield turbidity data between 5 feet and 9.5 feet above the river bottom at the sampling location. The cutterhead deployment may need to vary from the target of 5 feet above the river bottom due to the need to adjust the metering depth to account for potentially shallow water conditions at the dredge site.

Sample Collection Methodology

A YSI 6-Series Multiparameter Water Quality sonde will be stationed approximately 200 feet from the cutterhead presumably from an attachment point on the dredge vessel. The same model of sonde will also be deployed at a location approximately 1 mile upstream of the center of the dredge area and at a location approximately 1 mile downstream of the center of the proposed area to be dredged (see Figures 1 and 2). Prior to deployment, sondes will be calibrated based on the guidelines in the YSI User Manual (2009). The sondes will be positioned with a cable line at approximately 5 feet above the river bottom at mean low water to collect continuous readings. The length of the cable line will account for tide changes to fluctuate approximately four to six feet. A buoy will be attached by cable to an anchor and will be used to establish the sampling location. The sonde will be clipped to the cable and a second cable will be used to lower the sonde to the target depth and to retrieve the sonde for data downloading and servicing.

The sonde is an instrument that automatically collects data about the surroundings. The sonde will collect readings of river water turbidity, temperature, salinity, dissolved oxygen, and pH. The YSI 6-Series water quality sonde can hold approximately 150,000 readings before downloading is required and has a reported battery life range of 30 to 75 days. Based on that information, this plan anticipates that the sondes will be serviced and downloaded monthly during active dredging. The five parameters will be measured every 15 minutes throughout the duration of the active dredging cycle (except during servicing of the sondes), which should result in 4 readings of the five water column characteristics every hour for a total of approximately 2,880 readings within a 30-day period (14,400 data points) , well within the storage capacity of the sonde. The dredger will be required to log each dredging pass during the dredge cycle. This information, coupled with the direction of the current (flood, slack or ebb), will be used to determine whether the sonde was up-current or down-current of cutterhead during specific periods of data recording.

2.2 Collecting Monthly Environmental Water and Sediment Samples

Water samples will be collected once monthly at locations approximately 1 mile down-current of the dredge area, 200 feet away from the cutterhead, and 1 mile up-current of the dredge area for a large suite of water quality analyses. These samples will be collected at the same depth as the sondes deployed at each of the locations. Water samples will be collected using the Kemmerer bottle dedicated to the sampling location on the date of sampling. The time of day, stage of tide and direction of current will be recorded by the sampler when the water and sediment samples are collected. To the extent practical, the three water samples and one sediment sample will be collected within a single flood or ebb tide. An anticipated schedule of sampling for each construction dredge event has been included in Tables 1 and 2. The actual number of samples will be based on the actual duration of dredging for each event.

Sediment samples will be collected once monthly 200 feet down-current from the cutterhead on the same date as the above referenced water samples for the large suite of water quality analyses (See Table 1). Personnel will wear nitrile gloves during the collection of samples. The sediment samples will be collected using a Ponar device.

Sampling procedures for sediment and water samples are guided by the "QA/QC Guidance for Sampling and Analysis of Sediments, Water, and Tissues for Dredged Material Evaluations," prepared by the USEPA and USACE (1995). Sediment sampling guidance is in section 2.5.7.1 and water sampling guidance is in section 2.5.7.2. Section 2.5.8 discusses techniques for sampling, and Table 5 lists recommended sampling procedures for sampling collection, preservation, and storage. Sampling procedures will also be guided by the Surface Water Sampling SESD Operating Procedure for Discrete Depth Samplers in Section 7 (USEPA, 2013).

2.2.1 Kemmerer Discrete Sample Device Collection Equipment, Methods and Cleaning

Kemmerer bottles are a cylindrical sampling device that will be attached to a rope with indicator marks at set intervals to determine the depth at which the sample is being collected. The cylinders will be acrylic Kemmerer or stainless steel. Kemmerer bottles will be lowered into the water at each location and, when the appropriate depth has been reached, a 'messenger' will be released by the operator that descends the rope and forces the top end cap shut. The Kemmerer bottle is then lifted from the location and used to fill necessary laboratory bottles for analyses.

Three Kemmerer bottles will be used to collect the TSS samples, one dedicated to each of the three sampling locations. The sampling locations are 200 feet down-current of the cutterhead and the two background monitoring locations. Sampling depth will match the deployed depth of the sondes at each of the sampling locations. The personnel collecting the samples will wear single-use nitrile gloves during sampling efforts. Sampling will be performed in accordance with the Surface Water Sampling SESD Operating Procedure for Discrete Depth Samplers in Section 7 (USEPA, 2013) and the 'QA/QC Guidance for Sampling and Analysis of Sediments, Water, and Tissues for Dredged Material Evaluations' prepared by the USEPA and USACE (1995).

Decontamination of the Kemmerer bottles will occur offsite prior to use for the project by performing a detergent (Alconox®) wash, followed by a rinse with deionized water, a 10% nitric acid rinse for analysis of metals, and a hexane solvent rinse for analysis of organic compounds, in that order. The Kemmerer bottles should be left to air dry before being wrapped in aluminum foil for transport to the site.

2.2.2 Ponar Sample Device Collection Equipment, Methods and Cleaning

A Ponar sampler will be used to collect the monthly sediment sample 200 feet down-current of the cutterhead. The DNREC Standard Operating Procedures (SOP) associated with use and cleaning a Ponar grab sampler, last updated May 2021, will be used as a guide for collecting the sediment samples. The personnel collecting samples will wear single-use nitrile gloves

The Ponar sampling device will be cleaned prior to arriving at the site using a detergent (Alconox®) wash followed by a rinse with deionized water, then a 10% nitric acid rinse, and finally a hexane (solvent) rinse prior to bringing the device onsite.

2.3 Sampling Documentation

During the collection of the monthly water and sediment samples, the sampler will log the following to provide information regarding field conditions at the time of sampling:

- Latitude and longitude of sample collection point
- Weather conditions
- Direction of the current

- Time of sample collection
- Depth sample collected below water surface
- Approximate distance of sample collection from point of dredging
- Whether sample has been collected up-current, at the point of dredging, or down-current of dredging
- General visual observations about clarity of water collected and
- General sediment characterization

2.4 Sample Analyses

These water samples will be submitted to a qualified laboratory for the following analyses:

- Total Suspended Solids (TSS) by Method 2540D,
- pH by EPA Method 9045C,
- Hardness by Method 2340C,
- Dissolved organic carbon (DOC) by EPA Method 9060A,
- Particulate Organic Carbon (POC) by EPA Method 9060A,
- Total Target Analyte List (TAL) Inorganics by EPA Method 6020 and 7471,
- Dissolved TAL Inorganics by EPA Method 6020 and 7471,
- Target Compound List (TCL) Pesticides by Method 8081A,
- Polycyclic Aromatic Hydrocarbons (PAHs) and alkylated homologs by EPA Method 8270D,
- Dioxin and Furan Isomers by EPA Method 1613B, and
- Polychlorinated Biphenyls (PCB) Congeners by Method 1668

The sediment samples will be analyzed for grain size distribution and for the following:

- Total TAL Inorganics by EPA Method 6020 and 7471,
- TCL Pesticides by Method 8081A,
- PAHs and alkylated homologs by EPA Method 8270D
- Dioxin and Furan Isomers by EPA Method 1613B,
- PCB Congeners by Method 1668, and
- Total Organic Carbon (TOC) by Lloyd Kahn Method

2.5 Point of Dredge Data Assessment Methods

The plan is to collect the water samples at the same depth as the sondes at the time of sampling. The time of water sample collection will be used to allow precise comparison of TSS and turbidity data. The laboratory TSS data will be used to assess the continuing consistency of the relationship between turbidity and total suspended solids derived from the monitoring data collected for the Reach B and Reach C navigation channel deepening projects in the Delaware River.

Salinity data will be collected and used to ensure that proper criteria, either freshwater or marine, are being applied for assessing water quality. Salinity below 5.0 parts per trillion (ppt) constitutes the use of freshwater criteria while salinity at or above 5.0 ppt constitutes the use of marine criteria according to the DNREC, Division of Watershed Stewardship, Surface Water Quality Standards (2017). Freshwater criteria are anticipated in this area of the Delaware River, as previous studies and sampling results indicate a salinity below 5.0 ppt.

An average hardness value will be calculated using the laboratory reported data for water samples. Average hardness will be used to calculate specific criterion for metals in accordance with DRBC regulations.

First, statistics will be calculated in order to determine minimum, maximum, and average concentrations for the water samples collected 200 feet from the cutterhead and background water samples. The mean concentrations of each substance reported as being detected in the point of dredging water samples will be compared to the DRBC acute and chronic protection of aquatic life criteria since these criteria are the most stringent. PCB results will be compared to DRBC chronic protection of aquatic life criteria and DNREC human health water quality criteria since there are not acute protection of aquatic life criteria for comparison for total PCBs. Dioxin and furan as well as dioxin-like PCB data will be converted using toxic equivalency factors (TEFs) to TEQs and compared to the DNREC human health water quality criteria for 2,3,7,8-Tetrachlorodibenzodioxin (2,3,7,8-TCDD). Then, the same analysis and comparison will be performed on the down-current and up-current sample results. The up-current analytical results will be considered the background concentrations.

Once the mean concentrations from the water samples are compared to DRBC aquatic life criteria, and DNREC human health water quality criteria where applicable, the substances detected in the environmental water sample collected at the cutterhead will be compared to the mean background concentrations. If a ratio of the mean concentration to mean background condition is above 1, then substance concentrations likely increased due to the active dredging. Factors that should be considered when interpreting point of dredge data include weather conditions, the direction and stage of the current, and nearby river activities. Each of these factors and others will be monitored to more holistically assess field conditions at the time of sample collection.

The calculated TSS concentrations will be monitored as the dredge activity is occurring in order to assess whether TSS concentrations are below or sustained above the designated TSS concentration performance standard identified in the federal and state permits which is anticipated to be 250 mg/L at the monitoring location 200 feet down-current of the cutterhead. Measured TSS concentrations will be used to verify that the relationship between turbidity and TSS derived during the Reach C and Reach B deepening projects remain consistent with expectations.

Possible impacts to aquatic life at the point of dredging as a result of active dredge activity can be evaluated based upon the substances detected in water samples at concentrations that are elevated when compared to background concentrations and when compared to applicable DRBC aquatic life standards. The reported concentrations of substances in surface water samples collected 200 feet down-current of the active cutterhead also will be compared to the predictions of water quality during dredging provided in the SSWQA Report.

3. Water Quality Monitoring at CDF Locations

Once the hydraulic dredge cutterhead removes sediments from the proposed berth area, the dredge slurry will be transported to one of three locations: the primary CDF facility at WHSDA, the onsite CDF or the contingency disposal area WHNDA as indicated in Figure 1. The dredged sediments will enter the CDF as a dredge slurry (sediment mixed with river water). The CDF are designed to retain the slurry for a period of time sufficient to separate most of the water from the sediments and return the separated water to either the Delaware River for WHSDA and the on-site CDF or the Christina River, if WHNDA is used. The quality of the separated water (effluent) from these CDF has been predicted through calculations based on the principles of equilibrium partitioning and the physical characteristics of the sediment. Based upon the calculations, the predicted water quality and comparisons to applicable DRBC water quality standards are summarized in the SSWQA report.

The WHSDA will have an influent pipeline that runs from the active cutterhead of the dredge to the CDF. The CDF has as outlet works where the flow of effluent to the Delaware River can be controlled. An onsite CDF will be constructed and used to process a portion of the stratum B material during the initial dredging of the project. An influent pipeline will convey dredge slurry to the CDF. A constructed outlet works for the on-site CDF will be used to control the flow of effluent to the Delaware River. An influent pipeline will convey dredge slurry to WHNDA. As with WHSDA, the flow of effluent is controlled at the outlet works. Monitoring of the onsite CDF will be similar to the aforementioned methods used for monitoring at the WHSDA. The sample collection methodology and sample analyses at each location will be consistent and are detailed in Section b through d below, and the anticipated sampling locations are shown in Figures 3, 4 and 5.

3.1 CDF Influent Monitoring

3.1.1 Sample Collection Methodology

Once per month during active dredging, a grab sample of dredge slurry will be collected from the discharge of the influent pipeline (See Table 2). The grab sample will be collected using a pre-cleaned metal container attached to a pole (dipping sampler). The personnel collecting samples will wear single-use nitrile gloves and the dipping grab sampler will be decontaminated before being brought to the site. The grab sample will be transferred (poured) into a clean sealable container for transport to Duffield's soils laboratory where the container will be stored on ice for approximately 24 hours to allow separation of sediment and water.

After the approximate 24-hour period has elapsed and without disturbing the container, water will be drawn from the container using a peristaltic pump and single use tubing. The personnel transferring samples will wear single-use nitrile gloves. Water will be discharged into laboratory prepared sample containers. Any water excess to the volume needed to fill laboratory containers will be discharged to the sanitary sewer system. Following the removal of water, sediment will be poured from the separation container into laboratory provided containers. The water and sediment containers will be kept chilled pending transport to the laboratory for analysis.

The dipping sampler container and the sample container used for sediment and water separation will be cleaned prior to being taken to the site for use. The cleaning process will consist of washing with a deionized water and Alconox® solution, followed by an acid rinse (10% nitric acid solution) and a hexane solvent rinse and then be allowed to air dry. The openings of the containers will be sealed or covered with aluminum foil after drying and during transport to the site for use.

3.1.2 Sample Analyses

The monthly influent water samples will be analyzed for:

- TSS by Method 2540D,
- Total Dissolved Solids (TDS),
- TCL Pesticides by Method 8081A,
- Total TAL Inorganics by EPA Method 6020 and 7471,
- Dissolved TAL Inorganics by EPA Method 6020 and 7471,
- PAHs and alkylated homologs by EPA Method 8270D,
- Dioxin and Furan Isomers by EPA Method 1613B,
- PCB Congeners by Method 1668,

- DOC by EPA Method 9060A,
- POC by EPA Method 9060A, and
- TOC by Lloyd Khan Method

The influent sediment samples will be analyzed for:

- TCL Pesticides by Method 8081A,
- Total TAL Inorganics by EPA Method 6020 and 7471,
- PAHs and alkylated homologs by EPA Method 8270D,
- Dioxin and Furan Isomers by EPA Method 1613B,
- PCB Congeners by Method 1668, and
- TOC by Lloyd Kahn Method

The bulk influent sediment sample results will be reported on a dry weight basis.

3.2 CDF Effluent Monitoring

The plan is to collect effluent turbidity readings in nephelometric turbidity units (NTU) and flow rate information on a continuous basis at the CDF outlet works that are in use during active dredging. The monitoring will be done using a YSI 6-Series Multiparameter Water Quality sonde or equivalent instrument with automated data recording installed in the effluent discharge pipe downstream of the weir in the outlet works. A flow meter will also be installed to measure and record flow rate data. Data readings will be set to occur at 15 minute intervals. Flow rate and turbidity information will be downloaded and reviewed by Duffield personnel daily. Duffield will report the daily readings to the dredging contractor operating the active CDF and recommend adjustments as warranted to water retention or discharge.

The predictions calculated as part of the SSWQA indicated that an average total suspended sediment (TSS) concentration less than 3,000 mg/L, with instantaneous TSS concentrations not exceeding 4,000 mg/L in the CDF effluent would be adequate to protect water quality in the Delaware River. These TSS values correspond to average turbidity readings of less than 1,700 NTU, with instantaneous turbidity readings not exceeding 2,200 NTU, based on the relationships established in the referenced Reach B turbidity report.

3.3 CDF Effluent Water Samples

3.3.1 Sample Collection Methodology

Grab water samples will be collected from the effluent from each of the CDF in active use during active dredging. This plan anticipates that the grab samples can be collected from the discharge side of the weirs in the outlet works into laboratory suppled sample containers (See Table 2). The personnel collecting samples will wear single-use nitrile gloves

3.3.2 Sample Analyses

The effluent grab samples will be analyzed:

- TSS by Method 2540D,
- Total Dissolved Solids (TDS),
- pH by EPA Method 9045C,
- Hardness by Method 2340C,
- TCL Pesticides by Method 8081A,
- Dissolved TAL Inorganics by EPA Method 6020 and 7471,
- Total TAL Inorganics by EPA Method 6020 and 7471,
- PAHs and alkylated homologs by EPA Method 8270D,
- DOC by EPA Method 9060A,
- POC by EPA Method 9060A,
- TOC by Lloyd Khan Method,
- Dioxin and Furan Isomers by EPA Method 1613B, and
- PCB Congeners by EPA Method 1668.

3.4 CDF Effluent Data Assessment Methods

3.4.1 Calculation of Substances Sequestered in CDF

The influent CDF grab sample results coupled with dredge contractor provided estimates of slurry flow rates will allow estimation of substance concentrations entering the active CDF. The effluent water grab water sample results and flow rate data will provide information needed to estimate the mass of substances being returned to the Delaware River. Comparison of the inflow mass to the outflow mass of detected substances will provide estimates of the mass of substances retained in the CDF.

3.4.2 Calculation of Hardness Dependent Water Quality Criteria

The mean hardness value developed from sampling results for the Delaware River samples collected for the point of dredge assessment will be used to determine the applicable DRBC Water Quality Standard concentrations applicable for comparison to CDF effluent concentrations. The mean salinity value will be used to select the appropriate DRBC water quality criteria for comparison.

3.4.3 Assessment of Water Quality Compliance

On a monthly basis, CDF Effluent sample results will be compared to applicable DRBC standards. If none of the effluent substance concentrations exceed the applicable DRBC standards, no further assessment of the monthly effluent sampling data will be necessary.

However, if certain monthly substance concentrations exceed applicable criteria, additional assessment will be performed, starting with comparison of those effluent discharge concentrations to the background substance concentrations reported for the corresponding monthly up-current Delaware River water sample. The water quality assessment will cease if effluent concentrations are less than background concentrations.

In cases where certain effluent substance concentrations exceed both the DRBC criteria and the corresponding background river water concentrations, the background Delaware River substance concentrations will be used with the effluent substance concentrations to calculate total substance concentrations within the zone of initial dilution (ZID or near field mixing zone) and also to calculate concentrations after complete mixing occurs (far field mixing zone). The ZID calculation will be guided by Section 4.20.5.A.1 of the DRBC Water Quality Regulations (2010). The far field calculations will be guided by Section 4.20.5.A.4 of the DRBC Water Quality Regulations (2010). Delaware River flows used in these calculations will conform to the requirements of Section 4.30.7.B.2.c of the Water Quality Regulations (2010)

The ZID substance concentrations will be compared to DRBC acute protection of aquatic life, and DNREC human health systemic toxicant and human carcinogenic standards for fish ingestion to assess compliance. The far field concentrations will be compared to the DRBC chronic protection of aquatic life, and DNREC human health systemic toxicant and human carcinogenic standards for fish ingestion to assess compliance.

3.4.4 Comparison of Predicted and Actual Effluent Concentrations

At the conclusion of active dredging, the CDF effluent monitoring results will be compared to the predictions in the SSWQA Report to assess the usefulness of predictions.

4 Quality Assurance / Quality Control (QA/QC)

4.1 Laboratory Procedures

The laboratory selected for analytic services shall be one that is approved by the State of Delaware for work on Hazardous Substance Cleanup Sites (HSCA) and is familiar with Standard Operating Procedures for Chemical Analytic Programs (SOPCAP) for HSCA. The laboratory will be required to provide chronicles for each batch of samples submitted for analysis to support review of the suitability of the reported sampling results for the intended uses in the project.

4.2 Data Validation

Analytical results and the chronical received from the laboratory will be reviewed to verify that results are suitable for the intended purpose of monitoring water quality. PCB congener and dioxin and furan data, specifically will be compared to method blanks as the concentrations at which these substances are detected typically encounter interferences within laboratory equipment. Co-eluting congeners will be identified so as to not double count concentrations of such substances, and total PCB concentrations and toxic equivalence quotients (TEQs) will be calculated using validated data.

4.3 Sample Collection and Handling

Recommended sample collection, sample container requirements and handling prior to analysis are summarized in Table 3.

4.4 Quality Assurance Samples

The sampler will collect one duplicate water and one duplicate sediment sample during each monthly sampling. The location selected for duplicate water sample collection will be changed from sampling event to sampling event to distribute the duplicates samples to each of the sampling locations (Delaware River up-current, Delaware River cutterhead, Delaware River down-current, CDF influent, and CDF effluent). The duplicate water samples will be analyzed for the following:

- TSS by EPA Method 2540D,
- Total Dissolved Solids (TDS),
- pH by EPA Method 9045C,
- Hardness by EPA Method 2340C,
- DOC by EPA Method 9060A,
- POC by EPA Method 440.0,
- TOC by Lloyd Khan Method,
- Total TAL Inorganics by EPA Method 6020 and 7471,

- Dissolved TAL Inorganics by EPA Method 6020 and 7471,
- TCL Pesticides by EPA Method 8081A,
- PAHs and alkylated homologs by EPA Method 8270D
- Dioxin and Furan Isomers by EPA Method 1613B,
- PCB Congeners by EPA Method 1668

The sampler will collect one duplicate sediment sample per monthly sampling event. The location selected for duplicate sediment sample collection will be changed from sampling event to sampling event to distribute the duplicates samples to each of the sampling locations (Delaware River cutterhead and CDF influent). The CDF influent sample duplicate will be collected from the same settled influent sediment as the monthly influent sediment sample. The duplicate sediment samples will be analyzed for the following:

- TCL Pesticides by Method 8081A,
- Total TAL Inorganics by EPA Method 6020 and 7471,
- PAHs and alkylated homologs by EPA Method 8270D,
- Dioxin and Furan Isomers by EPA Method 1613B,
- PCB Congeners by Method 1668, and
- TOC by Lloyd Khan Method

Background sample results will be viewed as samples representative of field conditions. Each piece of reusable equipment will arrive on site cleaned and ready for use. To check on the efficacy of cleaning, an equipment rinse blank sample will be collected from one of the Kemmerer bottles, the Ponar sampler, one of the dipping samplers and the container used to settle influent slurry samples during each monthly sampling event after the equipment arrives in the field and prior to using the equipment to collect or contact environmental samples. The equipment rinse blank samples will be analyzed for the following:

- TCL Pesticides by Method 8081A,
- PAHs and alkylated homologs by EPA Method 8270D,
- Dioxin and Furan Isomers by EPA Method 1613B, and
- PCB Congeners by Method 1668

Analyses for volatile organic substance will not be performed as part of this monitoring program. As such, no trip blanks are required.

5 Coordination of Maintenance

The WHSDA and WHNDA CDFs are typically operated and maintained by the USACE. DSPC understands that it will be responsible for the following operations and maintenance activities while actively dredging into WHSDA and WHNDA:

- Deploying and maintaining monitoring devices for the CDF effluent,
- Operation and maintenance of the influent pipeline and discharge location in the CDF,
- Dike maintenance and construction should additional storage be needed,
- Daily review of effluent monitoring data,
- Daily electronic recordkeeping of the effluent flow rate and turbidity readings concentrations, and
- Monthly collection and analysis of the grab influent and effluent samples for the duration of the effluent discharge associated an active dredging period.

DSPC and its delegated contractors understand that the USACE will be responsible for the operations and maintenance at the WHSDA and WHNDA between and after active dredging and discharge periods from the CDFs associated with the project.

6 Recordkeeping, Corrective Actions and Reporting

6.1 Record Keeping

Delaware River monitoring at the active dredge site will be assessed for indications that dredging is compliant with permit conditions, water quality predictions, and water quality objectives as the analytic testing data becomes available. The following data will be recorded in order to maintain records in association with the issued federal and State of Delaware permits:

- Continuous water turbidity, temperature, salinity, dissolved oxygen, and pH monitoring data collected 1 mile up-current, 1 mile down-current, and 200 feet down-current of the active dredge cutterhead;
- Log of the dredging pass direction and current direction information during the dredge event, which will be utilized to associate the readings with the relationship to the operation of the cutterhead;
- Monthly reported results for grab water samples collected 1 mile up-current and 1 mile down-current of the active dredge site;
- Monthly reported results for grab sediment, and river water samples collected 200 feet down-current of the active dredge cutterhead;
- Daily turbidity and flow rate data associated with CDF effluent;
- Monthly CDF influent dredge slurry water and sediment sample results;
- Monthly CDF effluent water sample results;

- Sample collection information for the active dredge area and background samples, including:
  - Latitude and longitude of sample collection point
  - Weather conditions
  - Direction of the current
  - Time of sample collection
  - Stage of tide,
  - Ebb or flood tide
  - Depth sample collected below water surface
  - Approximate distance of sample collection from point of dredging
  - Whether sample has been collected up-current, at the point of dredging, or down-current of dredging
  - General visual observations about clarity of water collected
  - General characterization of sediment collected 200 feet down-current of the active cutterhead
- Site conditions at the CDF influent and effluent locations, including:
  - Weather conditions
  - Time of sample collection
  - General visual observations about clarity of water collected
  - General characterization of sediment collected from the influent
  - Flowmeter readings at the time of sample collection
- Water quality data, including turbidity, temperature, salinity, dissolved oxygen, and pH, gathered by the sonde deployed at Cherry Island Flats

Tables 1 and 2 provides a summary of the frequency at which monitoring will occur at the active dredge location in the Delaware River, at the CDF influent location during active dredging and at the CDF effluent location during the associated active dredge effluent discharge period.

6.2 Corrective Action

The results obtained from the monitoring during the discharge periods will be compared to the conditions in the issued federal and State of Delaware permits. If monitoring reveals that the TSS concentrations or turbidity readings and/or environmental sample results down-current of the cutterhead are not in compliance with the issued permit conditions, modifications to the dredge activity will be implemented (e.g. reduced dredge rate or cut depth) to address the non-compliant condition. If monitoring reveals that the TSS concentrations or turbidity readings and/or environmental sample results in the CDF effluent are not in compliance with the issued permit conditions, corrective measures including the placement of additional weir boards to increase the retention time will be implemented to address the non-compliant condition.

DSPC or its designated agent will provide notification and proposed corrective action in a letter submitted to DNREC and USACE in the event that non-compliance with the permit conditions is indicated by the monitoring results. The proposed corrective action will include a course of action to achieve compliance and a time frame in which compliance will be achieved.

6.3 Dredge Cycle Reporting

A written data summary report will be prepared following completion of each of the first two planned dredging cycles for the project. Copies of the reports will be submitted to DNREC and USACE. The reports will summarize monitoring activities, analytical testing results, water quality compliance, corrective actions initiated (if any), recommended changes to dredging or monitoring procedures (if any), and anticipated dredging schedule for the next cycle. After all three of the dredging cycles have been completed, a comprehensive summary report will be prepared and will include monitoring activities, analytical testing results, and water quality compliance. The report will also provide comparisons of monitoring results to pre-dredging predicted conditions. The data assessment methods mentioned in Sections 2.5 and 3.4 will be followed when preparing the reports.

MRB/BJD:acj
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TABLES

Table 1 - Summary of Point of Dredge Monitoring Samples
Monitoring Plan
Wilmington Harbor – Edgemoor Expansion Project

Dredge Cycle 1 (Tentative Fall/Winter 2022/23, 3.2 months)

Chemical Analysis	Point of Dredge Samples	Background & Down-Current Samples	QA/QC Samples [Dup, MS, MSD]	QA/QC Samples [EB]	Total
Sediment					
TOC	3		1		4
Total TAL Inorganics	3		1		4
TCL Pesticides	3		1	3	7
PAHs and Alkylated Homologs	3		1	3	7
Dioxin and Furan Isomers	3		1	3	7
PCB Congeners	3		1	3	7
Grain Size Analysis	3				3
Water					
TSS	3	2 x 3	1		10
pH	3	2 x 3	1		10
Hardness	3	2 x 3	1		10
DOC	3	2 x 3	1		10
POC	3	2 x 3	1		10
Total TAL Inorganics	3	2 x 3	1		10
Dissolved TAL Inorganics	3	2 x 3	1		10
TCL Pesticides	3	2 x 3	1	3	13
PAHs and Alkylated Homologs	3	2 x 3	1	3	13
Dioxin and Furan Isomers	3	2 x 3	1	3	13
PCB Congeners	3	2 x 3	1	3	13

Table 1 (cont.) - Summary of Point of Dredge Monitoring Samples
Monitoring Plan
Wilmington Harbor – Edgemoor Expansion Project

Dredge Cycle 2 (Tentative Summer 2023, 3.7 Months)

Chemical Analysis	Point of Dredge Samples	Background & Down-Current Samples	QA/QC Samples [Dup, MS, MSD]	QA/QC Samples [EB]	Total
Sediment					
TOC	4		2		6
Total TAL Inorganics	4		2		6
TCL Pesticides	4		2	4	10
PAHs and Alkylated Homologs	4		2	4	10
Dioxin and Furan Isomers	4		2	4	10
PCB Congeners	4		2	4	10
Grain Size Analysis	4				4
Water					
TSS	4	2 x 4	2		14
pH	4	2 x 4	2		14
Hardness	4	2 x 4	2		14
DOC	4	2 x 4	2		14
POC	4	2 x 4	2		14
Total TAL Inorganics	4	2 x 4	2		14
Dissolved TAL Inorganics	4	2 x 4	2		14
TCL Pesticides	4	2 x 4	2	4	18
PAHs and Alkylated Homologs	4	2 x 4	2	4	18
Dioxin and Furan Isomers	4	2 x 4	2	4	18
PCB Congeners	4	2 x 4	2	4	18

Table 1 (cont.) - Summary of Point of Dredge Monitoring Samples

Monitoring Plan

Wilmington Harbor – Edgemoor Expansion Project

Dredge Cycle 3 (Tentative Winter 2023/24, 1.9 Months)

Chemical Analysis	Point of Dredge Samples	Background & Down-Current Samples	QA/QC Samples [Dup, MS, MSD]	QA/QC Samples [EB]	Total
Sediment					
TOC	2		1		3
Total TAL Inorganics	2		1		3
TCL Pesticides	2		1	2	5
PAHs and Alkylated Homologs	2		1	2	5
Dioxin and Furan Isomers	2		1	2	5
PCB Congeners	2		1	2	5
Grain Size Analysis	2				2
Water					
TSS	2	2 x 2	1		7
pH	2	2 x 2	1		7
Hardness	2	2 x 2	1		7
DOC	2	2 x 2	1		7
POC	2	2 x 2	1		7
Total TAL Inorganics	2	2 x 2	1		7
Dissolved TAL Inorganics	2	2 x 2	1		7
TCL Pesticides	2	2 x 2	1	2	9
PAHs and Alkylated Homologs	2	2 x 2	1	2	9
Dioxin and Furan Isomers	2	2 x 2	1	2	9
PCB Congeners	2	2 x 2	1	2	9

Table 2 - Summary of CDF Monitoring Samples

Monitoring Plan
Wilmington Harbor – Edgemoor Expansion Project

Dredge Cycle 1A – WHSDA (Tentative Fall/Winter 2022/23, 2.1 months)

Chemical Analysis	Influent Dredge Slurry	Effluent Water	QA/QC Samples [Dup, MS, MSD]	QA/QC Samples [EB]	Total
Sediment					
pH	2		1		3
TOC	2		1		3
Total TAL Inorganics	2		1		5
TCL Pesticides	2		1	2	5
PAHs and Alkylated Homologs	2		1	2	5
Dioxin and Furan Isomers	2		1	2	5
PCB Congeners	2		1	2	5
Water					
TSS	2	2	1		5
TDS	2	2	1		5
pH	2	2	1		5
DOC	2	2	1		5
POC	2	2	1		5
TOC	2	2	1		5
Hardness		2	1		3
Total TAL Inorganics	2	2	1		5
Dissolved TAL Inorganics	2	2	1		5
TCL Pesticides	2	2	1	2	7
PAHs and Alkylated Homologs	2	2	1	2	7
Dioxin and Furan Isomers	2	2	1	2	7
PCB Congeners	2	2	1	2	7

Table 2 (cont.) - Summary of CDF Monitoring Samples

Monitoring Plan
Wilmington Harbor – Edgemoor Expansion Project

Dredge Cycle 1B – Onsite CDF (Tentative Fall/Winter 2022/23, 1.1 months)

Chemical Analysis	Influent Dredge Slurry	Effluent Water	QA/QC Samples [Dup, MS, MSD]	QA/QC Samples [EB]	Total
Sediment					
pH	1		1		1
TOC	1		1		1
Total TAL Inorganics	1		1		1
TCL Pesticides	1		1	1	2
PAHs and Alkylated Homologs	1		1	1	2
Dioxin and Furan Isomers	1		1	1	2
PCB Congeners	1		1	1	2
Water					
TSS	1	1	1		3
TDS	1	1	1		3
pH	1	1	1		3
DOC	1	1	1		3
POC	1	1	1		3
TOC	1	1	1		3
Hardness		1	1		2
Total TAL Inorganics	1	1	1		3
Dissolved TAL Inorganics	1	1	1		3
TCL Pesticides	1	1	1	1	4
PAHs and Alkylated Homologs	1	1	1	1	4
Dioxin and Furan Isomers	1	1	1	1	4
PCB Congeners	1	1	1	1	4

Table 2 (cont.) - Summary of CDF Monitoring Samples

Monitoring Plan
Wilmington Harbor – Edgemoor Expansion Project

Dredge Cycle 2 – WHSDA (Summer 2023, 3.7 months)

Chemical Analysis	Influent Dredge Slurry	Effluent Water	QA/QC Samples [Dup, MS, MSD]	QA/QC Samples [EB]	Total
Sediment					
pH	4		2		6
TOC	4		2		6
Total TAL Inorganics	4		2		6
TCL Pesticides	4		2	4	10
PAHs and Alkylated Homologs	4		2	4	10
Dioxin and Furan Isomers	4		2	4	10
PCB Congeners	4		2	4	10
Water					
TSS	4	4	2		10
TDS	4	4	2		10
pH	4	4	2		10
DOC	4	4	2		10
POC	4	4	2		10
TOC	4	4	2		10
Hardness		4	2		6
Total TAL Inorganics	4	4	2		10
Dissolved TAL Inorganics	4	4	2		10
TCL Pesticides	4	4	2	4	14
PAHs and Alkylated Homologs	4	4	2	4	14
Dioxin and Furan Isomers	4	4	2	4	14
PCB Congeners	4	4	2	4	14

Table 2 (cont.) - Summary of CDF Monitoring Samples

Monitoring Plan
Wilmington Harbor – Edgemoor Expansion Project

Dredge Cycle 3 – WHSDA (Fall Winter 2023/24, 1.9 months)

Chemical Analysis	Influent Dredge Slurry	Effluent Water	QA/QC Samples [Dup, MS, MSD]	QA/QC Samples [EB]	Total
Sediment					
pH	2		1		3
TOC	2		1		3
Total TAL Inorganics	2		1		3
TCL Pesticides	2		1	2	5
PAHs and Alkylated Homologs	2		1	2	5
Dioxin and Furan Isomers	2		1	2	5
PCB Congeners	2		1	2	5
Water					
TSS	2	2	1		5
TDS	2	2	1		5
pH	2	2	1		5
DOC	2	2	1		5
POC	2	2	1		5
TOC	2	2	1		5
Hardness		2	1		3
Total TAL Inorganics	2	2	1		5
Dissolved TAL Inorganics	2	2	1		5
TCL Pesticides	2	2	1	2	7
PAHs and Alkylated Homologs	2	2	1	2	7
Dioxin and Furan Isomers	2	2	1	2	7
PCB Congeners	2	2	1	2	7

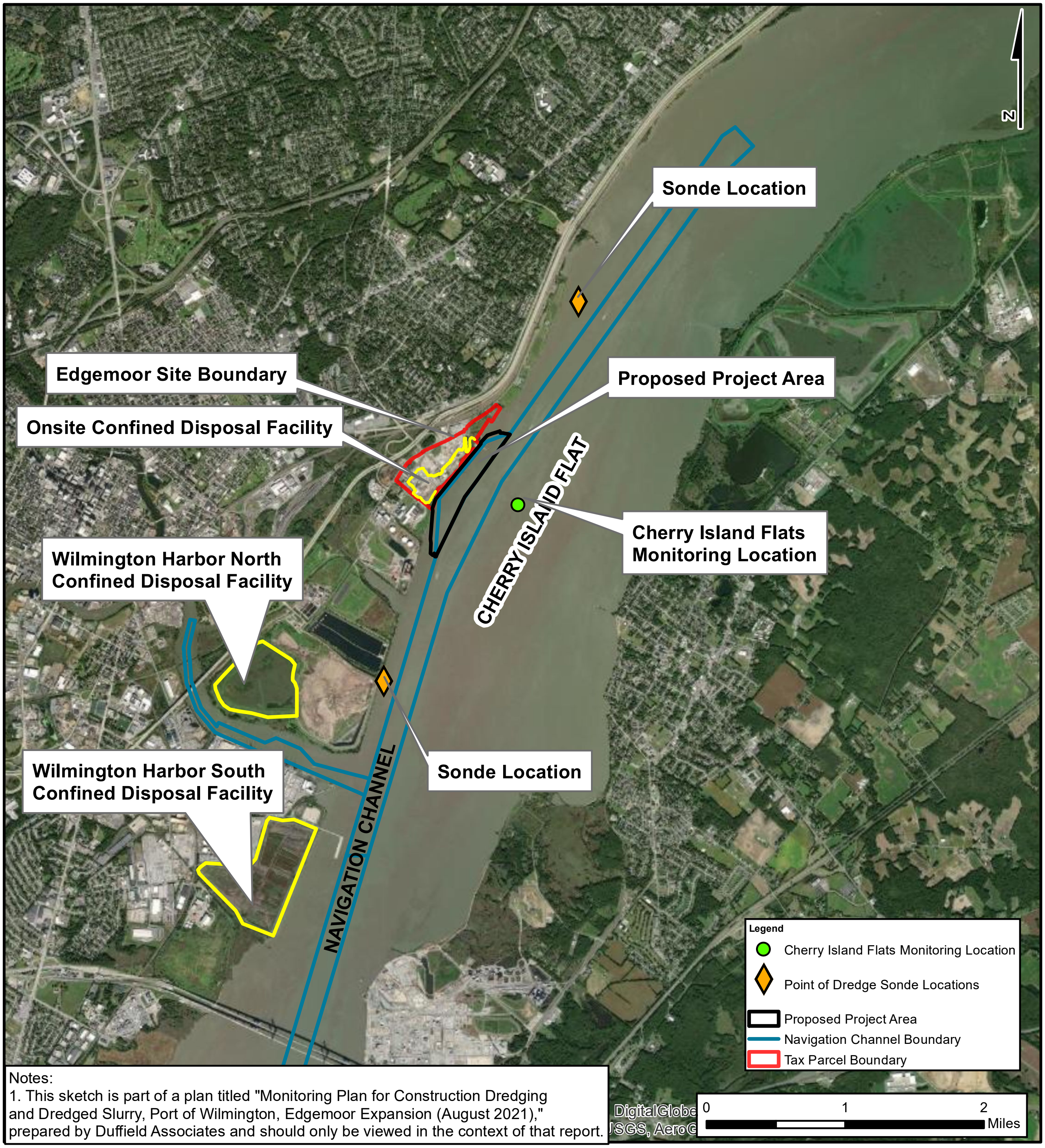
Table 3. Summary of Recommended Procedures for Sample Collection, Preservation, and Storage

Water Quality Monitoring Plan

Wilmington Harbor – Edgemoor Expansion Project

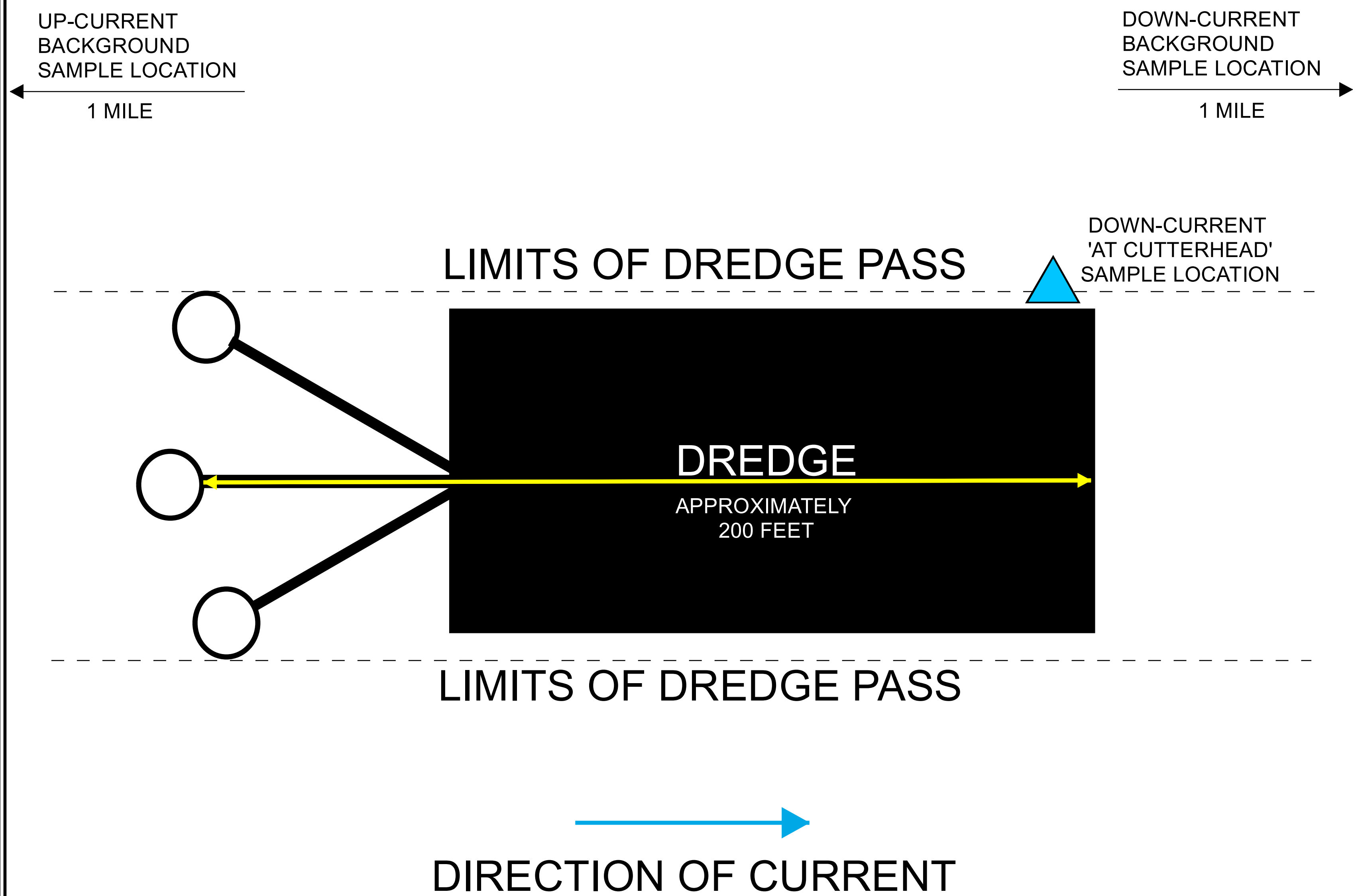
Analyses	Collection Method	Sample Volume	Container	Preservation Technique	Storage Conditions	Holding Times
Sediment						
TAL Inorganics (Total)	Ponar Grab	100 g	Pre-cleaned polyethylene jar	Refrigerate	≤ 4°C	Mercury – 28 days Others – 6 months
TCL Pesticides	Ponar Grab	250 g	Solvent-rinsed glass jar with Teflon-lined lid	Refrigerate	≤ 4°C/dark	14 days
PAHs and Alkylated Homologs	Ponar Grab	20 g	4-oz glass jar with Teflon-lined lid	Refrigerate	4°C	14 days
Dioxin and Furan Isomers	Ponar Grab	30 g	4-oz soil jar	Refrigerate	4°C	1 year
PCB Congeners	Ponar Grab		4-oz soil jar	Refrigerate	4°C	1 year
TOC	Ponar Grab	50 g	Heat treated glass vial with Teflon-lined lid	Refrigerate	≤ 4°C	14 days
Grain Size Analysis	Ponar Grab	500 g	16-oz wide unpreserved	Refrigerate	4°C	none
Water						
TSS	Discrete Sampler	500 mL	Polyethylene or glass jars	Refrigerate	4°C	7 days
pH	Discrete sampler	125 mL	HDPE jar	Refrigerate	4°C	15 minutes
Hardness	Discrete sampler	250 mL	Polyethylene or glass jars	Refrigerate, nitric or sulfuric acid	≤ 4°C	6 months
DOC	Discrete sampler	40 mL	Oven-dried glass jar with Teflon septum	Refrigerate	Cool ≤ 6°C	28 days
POC	Discrete sampler	80 mL	40 mL VOA Vial unpreserved	Refrigerate	≤ 4°C	100 days
TAL Inorganics (Total/Dissolved)	Discrete sampler	1 L	Acid-rinsed polyethylene or glass jar	Refrigerate, nitric acid	≤ 4°C / ≤ 2°C	Mercury – 28 days Others – 6 months
TCL Pesticides	Discrete sampler	250 mL	Amber glass jar with Teflon-lined lid	Refrigerate	≤ 4°C	7/40 days
PAHs and Alkylated Homologs	Discrete sampler	500 mL	Amber glass jar with Teflon-lined lid	Refrigerate	4°C	14 days
Dioxin and Furan Isomers	Discrete sampler	1 L	Amber glass jar with Teflon-lined lid	Refrigerate	≤ 4°C	Depends on lab capacity – up to 60 days
PCB Congeners	Discrete sampler	1 L	Amber glass jar with Teflon-lined lid	Refrigerate	4°C	Depends on lab capacity – up to 60 days
TOC	Discrete sampler	200 mL	Polyethylene or glass	Refrigerate	4°C	28 days

FIGURES



Notes:
1. This sketch is part of a plan titled "Monitoring Plan for Construction Dredging and Dredged Slurry, Port of Wilmington, Edgemoor Expansion (August 2021)," prepared by Duffield Associates and should only be viewed in the context of that report.

Date: 08/2021	FIGURE 1	DESIGNED BY: JLF	DUFFIELD ASSOCIATES Soil, Water & the Environment
SCALE: AS SHOWN	**CDF LOCATION SKETCH** MONITORING PLAN FOR CONSTRUCTION DREDGING AND DREDGED SLURRY WILMINGTON HARBOR - EDGEMOOR EXPANSION	DRAWN BY: JLF	5400 LIMESTONE ROAD WILMINGTON, DE 19808-1232 TEL. (302)239-6634 FAX (302)239-8485
PROJECT NO. 11139.LH		CHECKED BY: BJD	OFFICES IN PENNSYLVANIA, SOUTHERN DELAWARE, MARYLAND AND NEW JERSEY
SHEET: FIGURE 1	WILMINGTON~NEW CASTLE COUNTY~DELAWARE	FILE: 11139LH0621 CDFSampLoc.mxd	EMAIL: DUFFIELD@DUFFNET.COM



Notes:
1. This sketch is part of a plan titled "Monitoring Plan for Construction Dredging and Dredged Slurry, Port of Wilmington, Edgemoor Expansion (August 2021)," prepared by Duffield Associates and should only be viewed in the context of that report.

DUFFIELD ASSOCIATES
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OFFICES IN PENNSYLVANIA, SOUTHERN DELAWARE, MARYLAND AND NEW JERSEY
EMAIL: DUFFIELD@DUFFNET.COM

BASEMAP: NONE

DRAWN BY: JLF

CHECKED BY: BJD

FILE: 11139LH.0621. PointofDredgeConcept.mxd

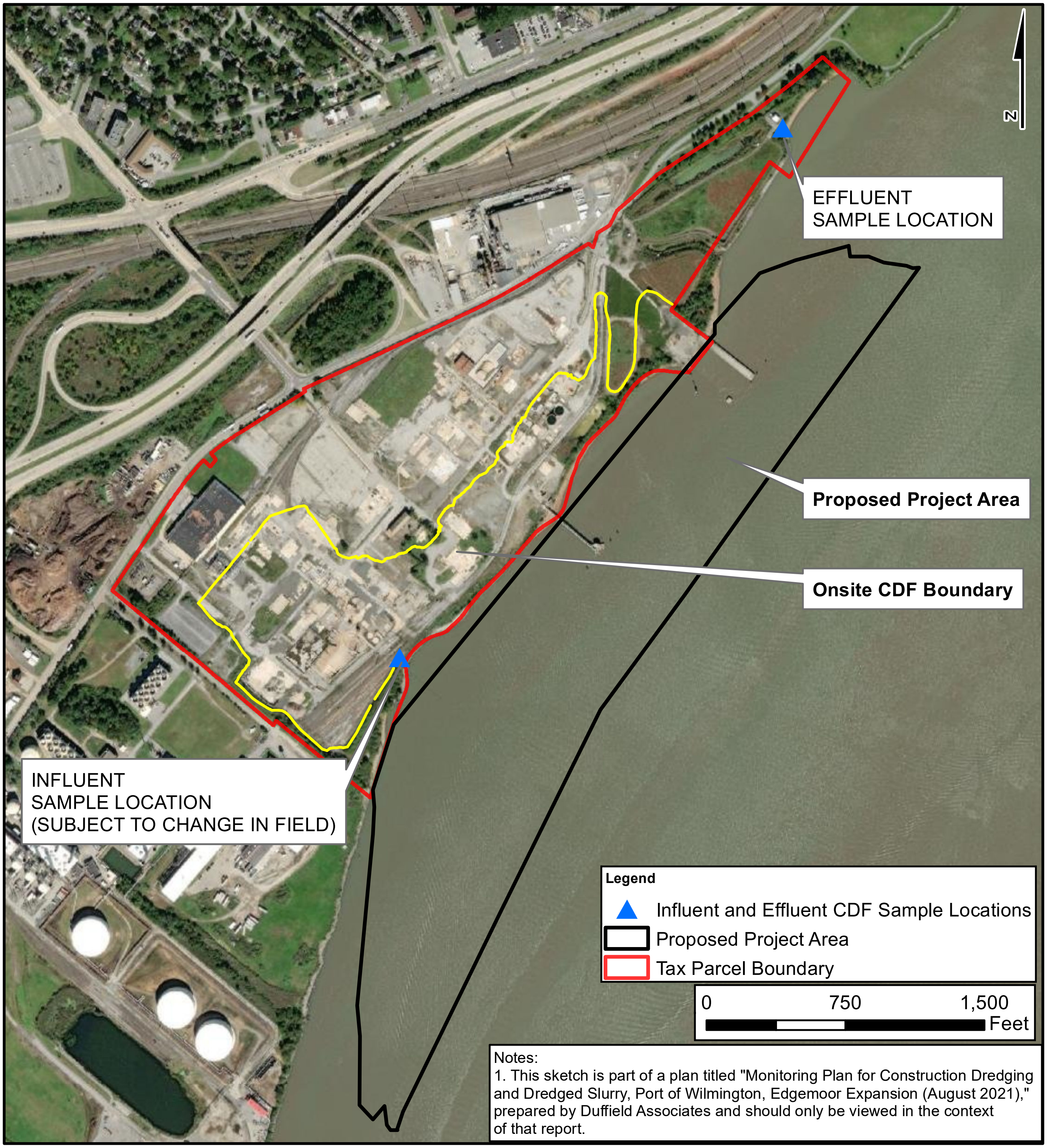
FIGURE 2
ACTIVE DREDGE CONCEPTUAL SAMPLE PLAN
MONITORING PLAN FOR CONSTRUCTION DREDGING AND DREDGED SLURRY
PORT OF WILMINGTON - EDGEMOOR EXPANSION
WILMINGTON~NEW CASTLE COUNTY~DELAWARE

Date: 08/2021

SCALE: NOT TO SCALE

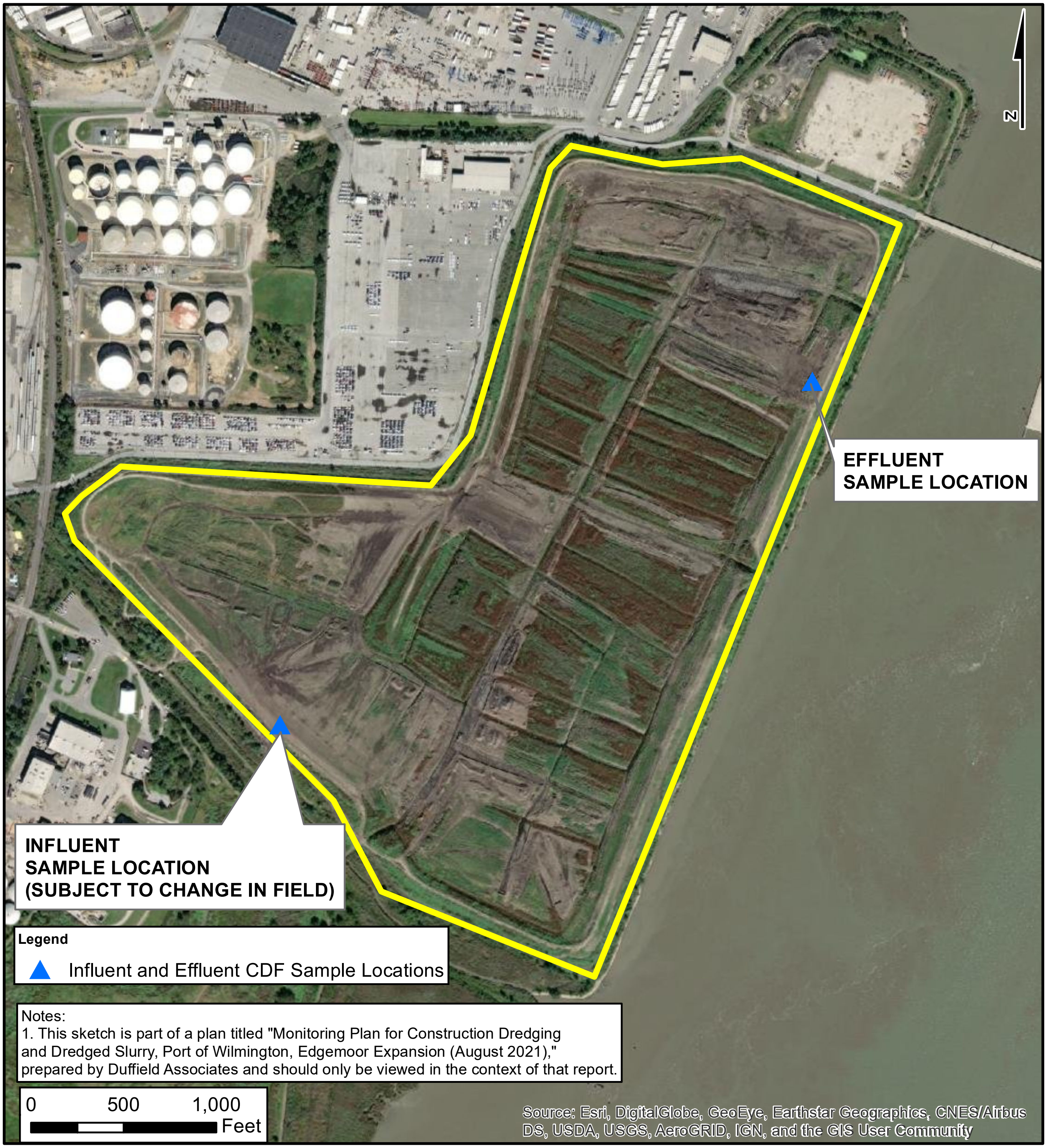
PROJECT NO. 11139.LH

SHEET: FIGURE 2

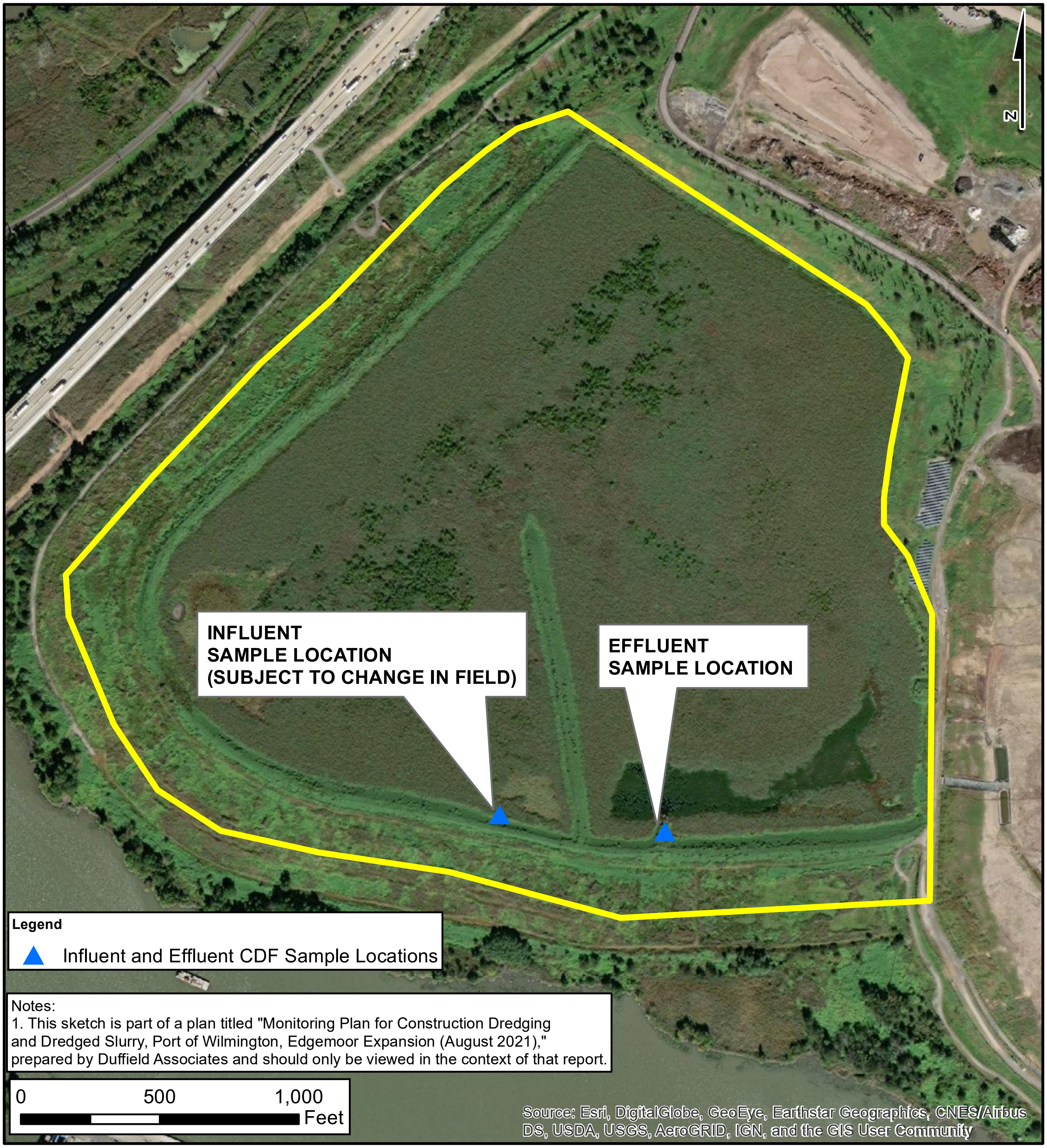


Notes:
1. This sketch is part of a plan titled "Monitoring Plan for Construction Dredging and Dredged Slurry, Port of Wilmington, Edgemoor Expansion (August 2021)," prepared by Duffield Associates and should only be viewed in the context of that report.

Date: 08/2021	FIGURE 3	DESIGNED BY: JLF	DUFFIELD ASSOCIATES Soil, Water & the Environment
SCALE: AS SHOWN	**ONSITE CONFINED DISPOSAL FACILITY SAMPLE LOCATION SKETCH**	DRAWN BY: JLF	5400 LIMESTONE ROAD WILMINGTON, DE 19808-1232 TEL. (302)239-6634 FAX (302)239-8485
PROJECT NO. 11139.LH	MONITORING PLAN FOR CONSTRUCTION DREDGING AND DREDGED SLURRY	CHECKED BY: BJD	OFFICES IN PENNSYLVANIA, SOUTHERN DELAWARE, MARYLAND AND NEW JERSEY
SHEET: FIGURE 3	PORT OF WILMINGTON, EDGEMOOR EXPANSION WILMINGTON~NEW CASTLE COUNTY~DELAWARE	FILE: 11139LH0621. OnsiteCDFLocMap.mxd	EMAIL: DUFFIELD@DUFFNET.COM



Date: 08/2021	FIGURE 4 **WILMINGTON HARBOR SOUTH CONFINED DISPOSAL FACILITY SAMPLE LOCATION SKETCH** MONITORING PLAN FOR CONSTRUCTION DREDGING AND DREDGED SLURRY PORT OF WILMINGTON - EDGEMOOR EXPANSION WILMINGTON~NEW CASTLE COUNTY~DELAWARE	DESIGNED BY: JLF	DUFFIELD ASSOCIATES Soil, Water & the Environment
SCALE: AS SHOWN		DRAWN BY: JLF	5400 LIMESTONE ROAD WILMINGTON, DE 19808-1232 TEL. (302)239-6634 FAX (302)239-8485
PROJECT NO. 11139.LH		CHECKED BY: BJD	OFFICES IN PENNSYLVANIA, SOUTHERN DELAWARE, MARYLAND AND NEW JERSEY
SHEET: FIGURE 4		FILE: 11139LH0621. WHSCDFLocMap.mxd	EMAIL: DUFFIELD@DUFFNET.COM



Date: 08/2021	FIGURE 5	DESIGNED BY: JLF	DUFFIELD ASSOCIATES Soil, Water & the Environment
SCALE: AS SHOWN	**WILMINGTON HARBOR NORTH CONFINED DISPOSAL FACILITY LOCATION SKETCH**	DRAWN BY: JLF	5400 LIMESTONE ROAD WILMINGTON, DE 19808-1232 TEL. (302)239-6634 FAX (302)239-8485
PROJECT NO. 11139.LH	WATER QUALITY MONITORING PLAN PORT OF WILMINGTON - EDGEMOOR EXPANSION	CHECKED BY: BJD	OFFICES IN PENNSYLVANIA, SOUTHERN DELAWARE, MARYLAND AND NEW JERSEY
SHEET: FIGURE 5	WILMINGTON~NEW CASTLE COUNTY~DELAWARE	FILE: 11139LH0621. WHNCDFLocMap.mxd	EMAIL: DUFFIELD@DUFFNET.COM