

STATEMENT OF BASIS

RCRA CORRECTIVE ACTION PERMIT MODIFICATION I

E.I. du Pont de Nemours & Company, Incorporated Pompton Lakes, New Jersey

EPA ID Number NJD002173946

I. INTRODUCTION

This Statement of Basis (“SB”) outlines the United States Environmental Protection Agency’s (“EPA”) corrective action decisions for the E.I. du Pont de Nemours & Company (“DuPont”) Pompton Lakes Works (PLW), 2000 Cannonball Road, Pompton Lakes, Passaic County, New Jersey. EPA has consulted with the New Jersey Department of Environmental Protection (“NJDEP”) in reaching these corrective action decisions.

DuPont is subject to the Corrective Action program under the Resource Conservation and Recovery Act (“RCRA”). The corrective action program is designed to ensure that facilities investigate and, if necessary, clean up any releases of hazardous wastes or hazardous constituents that may have occurred at their properties (including any releases that have migrated off-site). Pursuant to this program, DuPont has conducted numerous environmental investigations to characterize the nature and extent of contamination attributed to the DuPont facility and has implemented numerous interim corrective measures to address on-site and off-site contamination.

This SB includes an overview of corrective action efforts implemented at DuPont’s facility and off-site, and explains why EPA is issuing a permit modification to impose the remedy to address contamination at the Acid Brook Delta (“ABD”). Additional detail for this remediation will be imposed through approval of the ABD Area Revised Corrective Measures Implementation Work Plan (“CMIWP”), dated September 2011, which will be further revised in accordance with the requirements set forth in the permit modification, and as additional information on the project becomes available.

This permit modification is limited to the ABD study area, which is one of the 202 solid waste management units (“SWMUs”) and areas of concern (“AOCs”) that must be addressed by the Permittee. Remedy selection for the other remaining AOCs will occur in later permit modifications when investigations have been completed and remedies recommended by the Permittee are evaluated. Opportunities for public participation will continue to be provided through future public notices as well as informal meetings.

Information summarized in this SB is available in greater detail in the relevant documents identified herein and included in the Administrative Record for this facility. EPA encourages the public to review these documents in order to gain a more comprehensive understanding of environmental conditions at the DuPont PLW and the RCRA activities conducted to date. The documents are available for public review at the locations provided at the end of this SB.

II. DRAFT PERMIT MODIFICATION – PUBLIC REVIEW PROCESS – INTER-AGENCY CONSULTATION – ADDITIONAL INFORMATION

On November 20, 2011, EPA published a public notice for a draft permit modification, which proposed final remedy selection for the ABD sediments, the Upland Soils, and the Shoreline Properties

The ABD investigation looked at three major components -- the ABD sediments, the Uplands Soils, and the Shoreline Properties. In the draft permit modification, EPA proposed as the final remedy for the ABD the dredging of approximately 68,000 cubic yards of sediments from 26 acres of the Lake, which are contaminated primarily with mercury and lead, which would be removed and disposed of at an authorized off-site disposal facility. The proposed remedy also provided for the excavation of approximately 7,800 cubic yards of soil from approximately one acre of the Upland Soils area, contaminated with mercury and lead, which would also be disposed of at an authorized off-site disposal facility. It was determined that the Shoreline Properties were not impacted by ABD sediments during historic storms, and no corrective work was proposed for that area.

Prior to the public notice of the draft permit modification, EPA held a Public Availability (Information Session) in the Borough Council Chambers in Pompton Lakes on October 20, 2011, at which EPA made presentations and provided information on the proposed remedial actions, and public participants offered their views on the matter. EPA, pursuant to the procedures set forth in 40 C.F.R. Part 124, published a public notice of the draft permit modification on November 20, 2011 and provided a public comment period from November 20, 2011 to January 13, 2012 for any interested parties to submit written comments. A public hearing was held during the public comment period on January 5, 2012 at the Pompton Lakes High School, at which approximately 32 persons provided comments on the draft permit modification provisions. During the public comment period, written comments were received from 29 persons (one additional written comment was received after the end of the public comment period due to an electronic equipment problem experienced by the commenter; EPA granted permission for the late submission).

EPA used the administrative procedures set forth in 40 C.F.R. Part 124 to solicit public comments prior to making its final corrective action and permit modification decision(s) for the ABD. In making this decision, EPA has evaluated all written comments and comments from the public hearing received during the public comment period including one set of written comments that was submitted after the end of the public comment period. Relevant information and comments received on this project have influenced the development of the final permit modification. As required by regulations, EPA also consulted various federal agencies and the state for input on the proposed permit modification. Consultation with the United States Fish and Wildlife Services (“USFWS”) and the NJDEP have also influenced the

development of the final permit modification. In addition, DuPont (“Permittee”) provided to EPA, the results of a bathymetric survey, dated January 9, 2012. The survey was performed to compare the lake bed elevation to the 2007 bathymetric survey. This information also influenced the development of the final permit modification. This final permit modification is, therefore, the outgrowth of EPA’s public participation procedures, consultation with other regulatory and resource agencies, and evaluation of additional pertinent information received. This final permit modification includes the following requirements:

- An expanded ABD sediment removal program requiring removal of all sediment down to the peat layer in an expanded area from the mouth of the Acid Brook to a line nearer to the Ramapo River channel, running approximately north-south, and coinciding with the 2 ppm surficial mercury concentration contour line. This expanded area encompasses approximately 40 acres as compared to the originally proposed 26 acre dredging area.
- Sediment characterization sampling to delineate sediment mercury concentrations in the areas not initially targeted for dredging. The objective is to identify “hot spots” within the rest of the lake system which may require removal and to also characterize any sediment quality/contaminant impact from the Pompton Lakes Dam downstream to Riverside Park, Wayne, New Jersey (“Riverside Park”), a distance of approximately 3 miles. This will be conducted simultaneous with the ABD dredging.
- Design and implementation of a plan to establish baseline conditions of the Pompton Lake/Ramapo River system prior to dredging. This information will be used to help determine the effectiveness of the dredging/restoration project and the need for further dredging.
- Design and Implementation of a Post-Remedy Long-Term Monitoring Program of the lake system to confirm effectiveness of the dredging/restoration project.
- Design and performance of an updated Ecological Risk Assessment (“ERA”), utilizing up-dated risk data, bioaccumulation factors, and relevant collected site-specific information.
- Design and implementation of a revised Uplands Restoration Plan which ensures that the potential pathways for ecological receptors to mercury-contaminated soil are eliminated.

Except for the ERA Workplan, which must be submitted for EPA approval 30 days after the completion of all dredging activities, all workplans required under this permit modification are due for EPA review and approval 30 days after the effective date of the permit.

EPA considers the final version of the permit modification as an outgrowth of EPA’s evaluation of written and oral comments received concerning the proposed permit modification, review of additional relevant information, and consultation with NJDEP and USFWS.

III. FACILITY BACKGROUND

The DuPont PLW facility occupies approximately 570 acres of land, surrounded by mountainous areas to the north, Lake Inez (now drained) to the west and residential areas to the east and south. Two parallel valleys (Wanaque River and Acid Brook) run through the site north to south. Land use in the vicinity of the site is predominantly residential and commercial, but also includes undeveloped areas, an interstate highway (Route 287) and state-owned forest. (See Attachment 1.)

DuPont PLW conducted operations at the site from 1902 to April 1994, when the facility ceased its operations. Products manufactured included explosive powder (e.g., mercury fulminate and lead azide) and finished products (e.g., detonating fuses, electric blasting caps, metal wires, and aluminum and copper shells). The manufacturing operations and waste management practices resulted in contamination of the soil, sediment, and groundwater. The primary contaminants in the soil and sediments are lead and mercury. Groundwater contaminated with chlorinated volatile organic compounds (“VOCs”), such as tetrachloroethylene (“PCE”), trichloroethylene (“TCE”), cis 1,2-dichloroethylene, and vinyl chloride, has migrated off-site from the Eastern Valley part of the facility towards Pompton Lake.

Soil and sediment contamination occurred off-site along the Wanaque River, which flows through the Western Valley side of the facility. Operations in the Western Valley ceased in the mid-1920's and relocated to the Eastern Valley side of the plant. Due to releases of lead and mercury to Acid Brook, soil along Acid Brook was contaminated. Acid Brook flows from north to south through the Eastern Valley and discharges into the ABD of Pompton Lake, resulting in contamination of the ABD sediments.

Between 1991 and 1997, Acid Brook was the subject of remedial efforts that included streambed remediation and excavation of floodplain soil. The cleanup at the ABD in Pompton Lake is now the focus of this permit modification. DuPont submitted a permit modification application in April 2011 to propose final remedies for the ABD.

IV. REGULATORY AND PERMIT FRAMEWORK

In 1988, DuPont entered into an Administrative Consent Order (“ACO”) with the New Jersey Department of Environmental Protection (“NJDEP”). In 1992, EPA issued to DuPont a Hazardous and Solid Waste Amendments (“HSWA”) permit under the Resource Conservation and Recovery Act (“RCRA”). The NJDEP ACO and the EPA HSWA Permit required DuPont to conduct investigation and cleanup of contamination on and/or migrating from the site.

As a result of the RCRA Facility Assessment (“RFA”) conducted in 1986 and subsequent investigations conducted under the permit and Order, 202 solid waste management units and/or areas of concern (“SWMUs/AOCs”) were identified. The combined remedial investigation reports for the Northern Manufacturing Area, Western Manufacturing Area, and Eastern Manufacturing Area characterize conditions at the 202 SWMUs/AOCs on- and off-site. The off-site SWMUs/AOCs include: the Wanaque River, Acid Brook, ABD, and the groundwater plume.

In addition to the Remedial Investigation Reports (“RIR”) for the Northern, Eastern, and Western Manufacturing Areas, all three of which are dated June 30, 2010, there is the ABD RIR, dated December 19, 2008, the RIR for Pompton Lake Uplands, dated June 30, 2010, Acid Brook Delta Area Remedial Action Selection Report (“RASR”)/Corrective Measures Study (“CMS”), dated September 18, 2009, and the Acid Brook Delta Area Revised Corrective Measures Implementation Work Plan, dated September 2011.

Remedial activities have been implemented both on-site and off-site, to protect human health and the environment. These included off-site soil cleanup, on-site groundwater extraction, and long-term monitoring. Stabilization of the groundwater contaminated with volatile organic compounds (“VOCs”) is being implemented through an on-site groundwater pump and treat system. The groundwater is treated and the treated water is discharged into infiltration basins to flush through the aquifer. Numerous soil remedial and interim remedial activities have been implemented on-site to remediate and stabilize the contamination. In addition, due to off-site vapor intrusion, vapor mitigation systems have been installed by DuPont and third party contractors at more than 240 residences affected by the plume of VOC contaminated groundwater located between the site and Pompton Lake. Planning and installation activities are underway for additional homes.

The remainder of this SB will focus on the selected remedy for the ABD and the permit modification provisions for remedial actions for the ABD and lake

V. ABD OF POMPTON LAKE STUDY AREA

Pompton Lake is a 196-acre impoundment of the Ramapo River that was originally formed in 1858 when the Pompton Lakes Dam was constructed by the U.S. Army Corps of Engineers at the southern end of the lake. The Ramapo River flows over the Pompton Lakes Dam. Approximately 1.5 miles downstream, the Ramapo and Pequannock Rivers join to form the Pompton River. The Pompton River flows into the Passaic River, which empties into Newark Bay. The dam was enlarged in 1908. When the dam was enlarged, the area that is now the delta was submerged.

Current uses of the lake include boating and fishing. However, recreational activities on the lake are restricted. Due to elevated levels of coliform and bacteria within the surface water, swimming and wading in the lake are prohibited. There is a state consumption advisory for fish due to mercury from DuPont and other sources. The advisory also cites polychlorinated biphenyls, chlordane, dioxin, and DDX (DDT, DDE and DDD), which are from sources other than the DuPont PLW facility.

It is anticipated that current use of the lake will continue into the future. Restrictions on human use can be enforced as they currently are; however, restrictions cannot be applied to ecological receptors. While the potential for unacceptable risks were shown to be minimal, ecological data for the delta contained in the Ecological Risk Assessment (2003) indicated that mercury concentrations in some biota were higher in the delta than in the background reference areas.

The ABD Area includes three general areas (1) the portion in Pompton Lake (i.e., lake sediments) termed the delta, (2) the uplands portion defined as the soils between Lakeside Avenue and the water's edge along the lake (including wetland areas), and (3) the shoreline soils adjacent to Pompton Lake south of Lakeside Avenue Bridge and north of the Pompton Lake Dam. (See Attachments 1, 2, and 3.) The ABD lake sediments include the portion of Pompton Lake south of the Lakeside Avenue Bridge, east of the discharge point of Acid Brook into Pompton Lake, and west of the centerline of the former Ramapo River channel (as defined by the 2007 bathymetric survey of Pompton Lake).

The permit modification requires DuPont to design and implement a sediment characterization sampling plan, subject to EPA approval, for the eastern portion of the lake down to the Pompton Lakes dam and, for the portion beyond the dam along the Ramapo River to the wetlands area at Riverside Park (approximately 3 miles), a sampling strategy for range-finding will be employed.

(Note: The delineation of mercury is explained in greater detail in the Revised Acid Brook Delta Remedial Investigation Report ("ABD RIR"), dated June 19, 2008 and the Draft Remedial Action Plan, November 2006.)

VI. INVESTIGATIONS OF THE ABD STUDY AREA

Between 1995 and 2008, studies were conducted within the ABD area, including multiple phases of ecological investigation, scientific studies, and remedial investigations. In March 2004, NJDEP required DuPont to delineate the ABD sediment mercury contamination to 2 mg/kg. This is not a remediation goal, but a level much lower than human health standards that facilitated development of Remedial Action Objectives protective of ecological receptors. The major reports of the ABD Study Area include the Remedial Investigation Report ("RIR") for the ABD, dated December 19, 2008, the RIR for the Uplands, dated June 30, 2010, the Remedial Action Selection Report ("RASR")/Corrective Measures Study ("CMS"), dated September 18, 2009, and the ABD Area Revised Corrective Measures Implementation Work Plan, dated September 2011.

There are both human and ecological receptors in the ABD study area. Humans may have direct contact with surface water and sediment during recreational activities although recreational activities on the lake are restricted due to elevated levels of coliform and bacteria within the surface water. Swimming and wading in the lake are prohibited. It is expected that current use of the lake will continue into the future. Ecological receptors, aquatic species in particular, have direct contact with surface water and sediment. Both humans and ecological receptors may have direct contact with surficial soil and, to a lesser extent, subsurface soil. Surface water flow (i.e., rainfall) may potentially transport soil containing constituents of concern ("COCs") in the Uplands to the lake.

Therefore, the focus on risk management for impacted sediment is on the potential concern for ecological receptors.

A. ABD Sediments

The ABD sediment is the lake sediment in the area adjacent to the discharge of Acid Brook into Pompton Lake. The medium of concern in the ABD area is sediment.

Several site-related metals have been investigated as part of the ABD investigations including lead, mercury, copper, selenium, barium, and zinc. Barium, copper, selenium, and zinc concentrations are below the current the NJDEP Residential Direct Contact Soil Remediation Standards (“RDCSRS”) in N.J.A.C. 7:26D. In areas where lead is above RDCSRS, the lead-impacted area will be addressed by remediation of the co-located mercury-impacted area. The lead and mercury exhibit similar spatial distributions in that the highest concentrations of each are near the shore in the vicinity of the Acid Brook discharge. Mercury is the sole COC that methylates -- i.e., converts from the inorganic form to an organic compound through biological processing with certain bacterium to add a methyl-group-- and therefore, has the potential for bioaccumulation. Methyl mercury was identified as a COC in preliminary studies. It was, however, determined that methyl mercury distribution was based primarily on location and not on the concentration of mercury in the sediment. Therefore, mercury is the constituent driving the remediation both, in areal extent and in depth, and is the primary COC. The highest mercury concentrations, greater than 100 milligrams per kilogram, (mg/kg) were generally found in the sediment near the Acid Brook discharge.

To summarize the results of the ABD sediment investigation:

- Sediment thickness ranges from 0 to 5.2 feet. Sediment thickness, although variable, is generally less than 2 feet. Sediment is often, but not always, underlain by peat. (The peat is the original ground surface prior to the construction of the dam. The underlying peat ranges in thickness from 0 to 4.3 feet with an average thickness of 1.9 feet.)
- Water depth ranges from less than 1 foot near the mouth of Acid Brook to more than 18 feet near the Pompton Lakes Dam. In sediment, mercury concentrations along with other site-related metals generally decrease with distance from the mouth of Acid Brook. (Mercury was identified as the primary COC.)
- Surface water methyl mercury concentrations represent an integration of methyl mercury produced by the underlying sediment. The data shows that the near-shore sediment is the most important site of mercury methylation in the ABD area.
- In general, the distribution pattern of mercury in sediment overlying the peat is consistent with the physical parameters of the conceptual model -- i.e., the mercury concentrations decrease with distance from the discharge point of Acid Brook and increase with sediment depth.

B. Upland Soils Area Remedial Investigation

The Upland Soils Area encompasses approximately 2.6 acres south of Lakeside Avenue. Of those 2.6 acres, approximately 0.9 acres is a relatively flat area situated approximately 8 feet above the lake, 0.7 acres is a wooded slope, and 1 acre is relatively flat wetlands along the lake's shore.

For the Upland Soils area, soil is the primary medium of concern. Barium, copper, lead, mercury, selenium, and zinc were identified as COCs for either human health and/or ecological receptors in some areas of the Uplands. Lead and mercury are the primary COCs with detected concentrations above the NJDEP RDCSRS.

To enhance investigation efforts, the Upland Soils Area was divided into five areas (Areas A through E) to delineate the vertical and horizontal extent of site-related constituents in soil. Existing soil analytical data was used to focus the delineation sampling. Vertical delineation in surface soil (0 to 0.5 feet) was based on the lower value of NJDEP's November 2009 RDCSRS and ecological soil delineation criteria allowing for unrestricted use of the Uplands. The RDCSRS was used as the criteria for evaluating soil greater than 0.5 feet deep in the Uplands and surface soil for the shoreline.

Sampling results indicate that soils in Areas A through E were delineated to show the comparison to the applicable NJDEP soil remediation standard. (The results of this investigation are presented in the Pompton Lake Uplands RIR, dated June 30, 2010.)

Much of the soils in Areas A through E are located within the wetland transition zone or within the fully-established wetland. After consideration of applicable comments received during the public comment period, for the Upland Soil areas that are located within the wetlands transition zone or within the fully-established wetlands, EPA is requiring DuPont to design and implement a Remediation and Restoration Plan, subject to EPA approval, that will adequately address the ecological exposure pathway in soil to site contaminants or develop an updated "ecological soil delineation criteria" for the soil areas within the wetlands transition zone and the wetlands, that will be used to design the excavation. A combination of remedial measures and restoration in the Upland Soil areas will be utilized to address the ecological exposure pathway to remaining site contaminants.

C. Shoreline Properties Remedial Investigation

Soil sampling within the floodplain was also conducted to determine whether historic flooding may have deposited sediment containing site-related metals onto the shoreline properties. A floodplain analysis was completed to identify the low-lying areas of the adjacent properties along the lake. Samples were then collected from properties along the western shoreline adjacent to Pompton Lake south of Lenox Avenue and north of the Pompton Lake Dam, and analyzed for lead and mercury for characterization purposes. The results of the shoreline sampling indicated that the surface soil had not been impacted by ABD sediment during historic flooding events. The results of this investigation are presented in the Uplands RIR.

D. Sediments at Two Lower Ramapo River Channel Areas

During the remedial investigation mercury delineation studies, sediments in two lower Ramapo River channel areas upstream of the dam with elevated mercury detections were identified for potential inclusion in the remediation area targeted for sediment removal. One area is located on the northern side of an island, and the other area is located adjacent to the western shore at the beginning of the channel. However, after further delineation sampling in the spring of 2010, EPA no longer believes that removal of the sediments at the two areas is needed to meet the qualitative Remedial Action Objectives described in Section VI., below. The areas either exhibit low mercury concentration or are overlain by several feet of non-impacted sediment. (See Appendix A in the CMIWP, dated September 2011.) EPA had expected these conditions will be maintained or improved following implementation of the selected remedies and re-establishment of normal flow conditions over time.

However, after consideration of relevant information and comments received during the public comment period, EPA is requiring DuPont to perform a Sediment Characterization Sampling Plan for these and other areas outside of the initial dredging operations area, to determine whether any subsequent remedial activity should be required.

See Attachments 2, 3, 4, 5 and 6 for the contamination delineation of the ABD study area.

(See also the Acid Brook Delta Area Remedial Action Selection Report/Corrective Measures Study [September 2009] for a more comprehensive discussion.)

VII. **REMEDIAL ACTION OBJECTIVES (“RAOs”)**

RAOs were developed to address potential unacceptable risks associated with site conditions and the exposure pathways identified. These are media-specific goals that are aimed at protecting human health and the environment. The RAOs were developed as long-term, media-specific goals and were used to assist in selecting a remedial alternative to address elevated mercury concentrations in sediment and various metals concentrations in Uplands Soils.

For this project, potential exposure for human receptors to impacted soil and sediment is expected to be minimal. Previous investigations indicated that the ABD near-shore area had higher dissolved mercury and methyl mercury concentrations in surface water when compared to portions of the ABD area further from the shore and the rest of Pompton Lake. For ecological receptors, both the Ecological Risk Assessment (“ERA”) and triad weight of evidence approach indicated that the sediment does not pose an unacceptable risk to benthic macroinvertebrates. (See the Acid Brook Delta Ecological Investigation Reference Area Evaluation and Phase 1 Data Report, dated January 1997, and the Acid Brook Delta Ecological Investigation Phase 2 Report, dated January 2003.)

In developing the RAOs for the ABD study area, both quantitative and qualitative RAOs were considered in analyzing ways to reduce potential exposure to COCs in soil and sediment.

A. Quantitative RAO for Upland Soils

Quantitative RAOs are typically defined as promulgated numerical criteria that have been developed to be protective of human health and/or ecological receptors for a particular medium (i.e., sediment, soil). The specific values used for humans may be different than those for ecological receptors because of the differences in toxicity and exposure between the two receptor groups and the medium type. Therefore, while the concentration of a particular constituent in sediment may be unacceptable for ecological receptors, the same concentration in sediment may not result in an unacceptable risk for humans.

For Upland Soils north or outside of the wetlands transition area, both human health and ecological criteria have been selected as the RAOs. As presented in the approved work plan for surface soil (0 to 0.5 foot), the RAOs are based on achieving the lower value of the two, the Residential Direct Contact Soil Remediation Standards and ecological soil delineation criteria. Using the lower value of the RDCSRS and ecological soil delineation criteria allows protection for use of the Uplands by humans while also providing adequate protection for ecological receptors. For subsurface soil (i.e., deeper than 0.5 foot), the RAO is the RDCSRS. As such, the criteria for the constituents of concern (“COCs”) considered in establishing the RAOs for the uplands area are provided below.

Uplands RAOs and Removal Criteria

Analyte	Surface Soil Criteria (mg/kg)	Subsurface Soil Criteria (mg/kg)
Copper	1,100	3,100
Mercury	20.5	23
Lead	400	400
Selenium	5.05	390
Zinc	1,507	23,000

Therefore, to achieve the project RAOs, Upland Soils with contaminants exceeding the applicable criteria will be removed and disposed of at an authorized facility.

Regarding Upland soils within the wetlands transition area and fully-established wetlands, after consideration of applicable comments received during the public comment period, EPA is requiring DuPont to design and implement a Remediation and Restoration Plan, subject to EPA approval, that will adequately address the ecological exposure pathway to site contaminants or develop an updated “ecological soil delineation criteria” for the Upland Soil Areas within the wetlands transition zone and the fully-established wetlands. (The excavation limits will be based on the up-dated ecological soil delineation criteria.) A combination of remedial measures and restoration in the Upland Soil areas will be utilized to address ecological exposure pathway to remaining site contaminants.

B. Qualitative RAO for the ABD Sediment

There are no promulgated applicable remediation standards for sediment to use as a quantitative RAO. However, remediation standards can be narrative standards to which contaminants must be treated, removed or otherwise cleaned in order to meet health risk or environmental standards. As such, qualitative RAOs (narrative standards) were developed for the ABD area sediment to set long-term goals for protecting human health and the environment.

It is anticipated that the current use of the lake will continue in the future by both human and ecological receptors. Restrictions on human use can be enforced as they currently are; however, restrictions cannot be applied to ecological receptors. While the potential for unacceptable risks were shown to be minimal, the ecological data for the ABD area indicated that mercury concentrations in some biota were higher in the ABD area than in reference areas.

Previous investigations concluded that mercury in ABD area sediment appears to be tightly bound to the fine-grained particles as indicated by toxicity characteristic leaching potential (“TCLP”) data. However, biological processes in the upper few centimeters of sediment are able to mobilize some mercury in the form of methyl mercury, which then enters the food chain. Furthermore, the near-shore area within the ABD has higher dissolved mercury and methylmercury surface water concentrations when compared to portions of the ABD further from the shore and the rest of Pompton Lake.

It should be noted that the RAOs for the ABD sediment are driven by ecological risk and not human health risk. In order to be protective of ecological receptors, the following qualitative RAOs for the ABD sediment were developed:

- Reduce the potential for mercury methylation in near-shore sediment; and
- Reduce the area of exposure of ecological receptors to elevated mercury concentrations in ABD sediment.

Along with the numerous sediment delineation sampling data, multiple lines of evidence (such as dissolved mercury study, methyl mercury potential study, toxicity study, and the ecological risk assessment), the RAO Limit line for the ABD was established. The region to the west of the RAO Limit line will be the area targeted for sediment removal. (See Draft Remedial Action Plan, November 2006 for details on sediment delineation and studies supporting the lines of evidence for the RAO Limit line.)

After consideration of additional information relevant to the ABD and applicable comments received during the public comment period, in the final permit modification, EPA requires DuPont to (1) expand the dredging area footprint; (2) conduct sediment sampling at the portion of Pompton Lake that is not targeted for the initial dredging and the Ramapo River channel downstream to the Pompton

Lakes Dam; (3) conduct sediment sampling to determine contaminant impact to the portion of the river from the dam downstream to the wetlands adjacent to Riverside Park; (4) conduct an ecological risk assessment two years after the restoration of the dredged areas; and (5) conduct long-term monitoring of the lake system (post-Restoration) and establish baseline conditions (prior to excavation and dredging).

Baseline conditions must be established prior to dredging. Long-term monitoring will be considered in the design of the sampling requirements to establish the baseline.

VII. REMEDIAL ALTERNATIVES AND REMEDY SELECTION

A. Remedy Selection

A detailed analysis was completed for five remedial alternatives to evaluate the general suitability of various remediation technologies to meet the established RAOs and specific objectives. The following remedial action alternatives were evaluated as part of the RASR/CMS:

Alternative #1: No Action

Alternative #2: In-Situ Stabilization

Alternative #3: Capping

Alternative #4: Removal of sediment (shallow and deep) and soil (uplands)

Alternative #5: Removal of sediment (shallow) and soil (uplands) and Capping (sediment area beyond 5 feet deep water)

Based on the screening evaluation of the five remedial alternatives listed above, Alternatives #4 and #5 were retained for further review. EPA has now selected Alternative #4: Removal of sediment (shallow and deep) and soil (uplands) because:

- Removal reduces the potential for mercury methylation in near-shore sediment within the ABD area.
- Removal increases the amount of material removed from the lake and will, therefore, increase the water storage capacity of Pompton Lake.
- There are no concerns regarding contaminant mobility if the contaminant is removed.
- There are no concerns regarding cap stability during storm events.
- There is no need for a long-term cap monitoring program.

Alternative #5 was also considered to be a viable remedial alternative for the ABD area. However, we prefer Alternative #4 because, although adequately protective, capping would decrease the depth of the Lake and therefore, its capacity. The capacity of the Lake is important in terms of flood control.)

It should also be noted that NJDEP has a policy to reduce the mercury contamination under its New Jersey Mercury Reduction Action Plan (November 2009), which provides additional support for the Alternative #4.

(A more detailed description of the remedial alternatives and selection process is in the document, Acid Brook Delta Area Remedial Action Selection Report/Corrective Measures Study, dated September 2009.)

The final permit modification includes the following requirements that are in addition to the provisions that were publicly noticed on November 20, 2011 in the permit modification draft.

- Upland Soil Areas

- The Upland Soil Areas that are located outside the wetlands transition zone and the fully-established wetlands will be excavated, based on the NJDEP SRS.
- For the Upland Soil Areas within the wetlands transition zone and the fully-established wetlands zone, DuPont is required to design and implement a Remediation and Restoration Plan, subject to EPA approval, that will adequately address the ecological exposure pathway to site contaminants or develop “updated ecological soil delineation criteria,” on which the excavation limits will be based. A combination of remedial measures and restoration in the Upland Soil areas will be utilized to address ecological exposure pathway to remaining site contaminants.

- ABD Sediment

- DuPont is being required to dredge the area west of the RAO line, which now extends east to approximately coincide with the Ramapo River channel (and the 2 ppm concentration line), as depicted in Attachment 7.
- DuPont shall design and conduct sediment characterization sampling (to be designed with the objective of delineation of areas of high mercury concentration) in the eastern portion of the “RAO line” and along the Ramapo River channel downstream to the dam. An evaluation of the contaminant distribution shall be made in consultation with EPA and USFWS to identify areas of high mercury concentration for removal.
- DuPont is being required to design and implement a sediment sampling plan designed with the objective of determining how far downstream the contaminant impact may reach. The sampling will occur in the Ramapo River south of the dam to the wetlands adjacent to Riverside Park. The sampling results will be evaluated to determine whether there should also be sampling further downstream.

- Long-Term Monitoring Program

- DuPont will design and implement a long-term monitoring program of the lake system to ensure that the restoration plan adequately addressed the elimination of exposure pathways to contaminated sediment or soil.

- DuPont will establish a baseline for the lake project, subject to EPA approval. The baseline will be established prior to dredging. A sampling plan will therefore be designed to gather the information needed to establish the baseline.

- **ERA** -- Two years after the restoration plan is carried out, DuPont will conduct an ERA of the lake system, which will utilize up-dated risk data and information.

Subsequent corrective action activities, if any, will be determined by the results of sediment sampling plans and the ERA findings.

B. Anticipated Post-Remediation Result – Sediment

The selected final remedy for the ABD sediment consists of dredging the area west of the extended RAO line, as depicted in Attachment 7 to this module, conduct additional sediment characterization in the east portion of the lake outside the RAO line and downstream to the Pompton Lakes dam, and conduct range-finding sampling beyond the dam to Riverside Park. As a result of additional sediment characterization sampling, additional areas of sediment may be required to be dredged. Implementation of the final remedy is expected to result in the removal of a greater mass of mercury than in the proposed version, specifically:

- 100% reduction of mercury in the near-shore environment of the ABD;
- A greater reduction in mercury in the surficial sediment (0 to 0.5 feet)
- A greater reduction in mercury in the deep sediment (>0.5 feet); and
- A greater reduction overall of mercury in the ABD area.

C. Anticipated Post-Remediation Result – Soil

The design and implementation of the Remediation and Restoration Plan, subject to EPA approval, and consisting of a combination of remediation (including excavation and engineering control) and restoration at the Upland Soil areas or excavation to an EPA approved “updated ecological delineation criteria” will ensure that the ecological exposure pathway will be adequately addressed in the Upland Soil areas.

VIII. REMEDIAL APPROACH FOR THE ABD TO BE IMPOSED BY THE PERMIT MODIFICATION

This permit modification imposes conditions which require DuPont to implement dredging the ABD and excavation of the Uplands soils, sediment sampling at the portion of the lake that is not targeted for dredging to the dam and from south of the dam to Riverside Park, up-dated ecological risk assessment, and long-term monitoring. Additional operational details are included in the latest revision to the Corrective Measures Implementation Workplan (“CMIWP”) submitted September 2011. In light of changes to the permit modification which have been incorporated into final permit conditions, DuPont is required to submit an updated CMIWP to address any changes necessary to implement the final remedies.

EPA is also requiring DuPont to identify how the CMIWP comports with Green Remediation practices and principles outlined in EPA Region 2’s “Clean and Green Policy” as part of the up-date. The goal of the Region 2 Clean and Green Policy is to enhance the environmental benefits of federal cleanup programs by promoting technologies and practices that are sustainable. Additional information on the policy is available at the following website:

http://www.epa.gov/region02/superfund/green_remediation/policy.html

The operational details of the project to be determined include: methods and location for treatment, locations for equipment mobilization, sediment transport routes, and specific locations for temporary storage and stabilization areas.

These are the major components of the remedial approach in the CMIWP, as outlined in the September 2011 submittal:

A. Dredging Containment System

A containment system using rigid and/or flexible methods will be installed around the ABD area to provide an engineering control to protect the surrounding water from re-suspended sediment that may be generated during dredging activities. The chosen system will enclose the removal area and will be put in place prior to any removal activities. The uplands removal area will be isolated with control measures to reduce the potential for erosion or washout from disturbed areas to uncontained areas of the ABD or other areas within the uplands.

Note: It is expected that there will be a buffer zone of approximately 50 feet between the area for targeted sediment removal and the rigid containment system. The area to be dredged will extend as close to the rigid containment system as practicable, and the amount of sediment to be removed will exceed the estimated 68,000 cubic yards.

B. Dredging and Excavation

ABD sediments will be dredged (in the wet) using hydraulic equipment. The sediment will be pumped or placed into small scows or other suitable containers on a barge for subsequent transport/re-handling. The removal area consists of the area from the discharge point of Acid Brook into Pompton Lake to approximately the Ramapo River channel. (See Figure 1, Permit Module Supplement.) Conventional excavation equipment will be used to excavate the Uplands Soils.

Confirmation of dredging completion will be conducted using both traditional and dredge mounted survey techniques. For the Uplands Soils, removal completion confirmation surveying will be used to verify that the horizontal and vertical limits of removal have been achieved.

C. Re-handling and Solidification

The dredged sediment will be moved to the shoreline. Sediment in the ABD area is a very soft, fine-grained material with very low strength. It is expected to require solidification prior to transport and disposal to meet disposal requirements. The Uplands Soil is typical of conventional earthwork projects and may not require any solidification prior to disposal. It will likely be loaded directly into trucks for transport.

D. Sediment Transport

After all necessary treatment, the sediment and soil will be transported for disposal or re-use at an authorized off-site facility.

E. Restoration

Following dredging and removal, the Uplands area and adjacent wetlands will be restored. The restoration plan will include re-grading of the Uplands to accommodate planting with native vegetation, and placement of park amenities and pathways for public use. In the ABD, the dredged area will be restored by placing a granular layer of sand (i.e., eco-layer) over the dredged area to establish a zone for benthic community re-colonization over time. Additionally, planting and seeding of desirable aquatic native vegetation in the ABD area will take place. The plantings, along with the sand layer, will expedite restoration and increase the ecological functions of both the aquatic and benthic habitats.

The RAO for the Restoration stage is to adequately address the elimination of exposure pathways to contaminated sediment or soil.

F. Monitoring

Water column monitoring will be performed during the dredging and eco-layer placement activities within the ABD area to assess the potential impacts of the remedial activities (e.g., turbidity and mercury concentration). Air monitoring will be conducted during excavation, dredging, and material handling and processing activities. Monitoring will also be conducted for activities that may cause vibration (e.g., rigid barrier installation within the ABD area) at structures within a specified distance from the work area. We will also develop an appropriate post-remediation monitoring program as part of the CMIWP to monitor the effectiveness of the implemented remedies and confirm expected conditions over time.

There is a river diversion along the Ramapo River (south of the Pompton Lake outlet), which is used by North Jersey District Water Supply Commission (NJDWSC) as one of the three intakes feeding the Wanaque Reservoir and has a capacity of delivering up to 150 million gallon per day (MGD), on an "as needed basis," and which is ultimately treated before being transmitted to the municipalities as drinking water. Use of turbidity curtains and water column monitoring will ensure no adverse impact to the water used by the NJDWSC.

G. Additional Sediment Sampling at Pompton Lake and Ramapo River Channel

Contemporaneous with the dredging operation, DuPont will be required to conduct additional sediment characterization sampling, designed with the objective of determining contaminant distribution within the portion of the lake that is not targeted for the initial dredge, in the portion of the lake east of the RAO line and along the river channel to the dam. Additional sediment sampling, designed with the objective of determining the extent of site-contaminant impact downstream of the lake, will be conducted from the dam to Riverside Park. (Riverside Park is an initial endpoint. The sampling results will be evaluated to help determine the need to sample further downstream.)

H. ERA

Two years after the Restoration stage is complete, DuPont is required to conduct an ERA of the lake system, which will utilize up-dated ecological risk data and information.

IX. RCRA CORRECTIVE ACTION CONCLUSIONS

The corrective action decisions by EPA contained in the Permit Modification I, including the dredging in the ABD and the excavation of Upland Soil areas, are based on the Acid Brook Delta Area Remedial Action Selection Report/Corrective Measures Study, September 2009 ("RASR/CMS") and the Acid Brook Delta Area Revised Corrective Measures Implementation Work Plan, dated September 2011 ("CMIWP"). The corrective action decisions in the final Permit Modification contain revisions that are discussed in this SB. It is EPA's position that the corrective measure (or remedy) selection, as revised, conforms to the requirements set forth at Permit Module VI.7(a) and (b)

for corrective measure selection. In addition, the CMIWP, which will be revised and submitted for EPA approval, is expected to conform with the requirements set forth at Permit Module VI.8.a for corrective measure implementation.

X. FINANCIAL ASSURANCE

The permit modification incorporates provisions for financial assurance for corrective action, pursuant to 40 CFR 264.101 and Section 3004 of RCRA. The provisions list mechanisms the Permittee may use to establish financial assurance and requires that the Permittee establish and keep up-to-date a cost estimate for necessary corrective action. The initial estimate must be submitted within 90-days of the effective date of this permit modification.

XI. PUBLIC PARTICIPATION

EPA and NJDEP have participated in the Pompton Lakes Community Advisory Group (“CAG”) since October 2010. EPA has asked for input from the community on what type of information would be most useful. As a result, in many of the CAG sessions EPA made presentations and responded to questions from the community.

In addition, DuPont conducted a poster session in July 2011 in which it presented many of the options to be determined in the CMIWP. EPA conducted an Availability Session on the proposed remedy selection for the ABD on October 20, 2011. EPA will continue to conduct regular information sessions as a means of outreach in this community, and will also prepare newsletters on the remediation project.

EPA, NJDEP and DuPont will continue to be responsive by conducting activities and developing communications tools to provide timely dissemination of information to the public and encourage on-going, two-way communication between DuPont and external stakeholders.

These activities will include: meetings, regular information sessions, outreach office, website presence, news releases, newsletters, and fact sheets.

This Statement of Basis, final permit modification and Responsiveness Summary, and other relevant documents can be reviewed at:

Pompton Lakes Public Library
333 Wanaque Avenue
Pompton Lakes, New Jersey
(973) 835-0482
<http://www.pomptonlakeslibrary.org/libraryinfo.stm>

The administrative record and all relevant documents pertaining to the facility may be reviewed Monday through Friday from 8 AM to 4 PM at:

U.S. EPA
RCRA Records Center
290 Broadway, 15th Floor, Room 1538
New York, NY 10007-1866
(212) 637-3043

The permit modification and relevant documents are also available at:

EPA website:

http://www.epa.gov/region02/waste/dupont_pompton/index.html

and at:

New Jersey Department of Environmental Protection website:

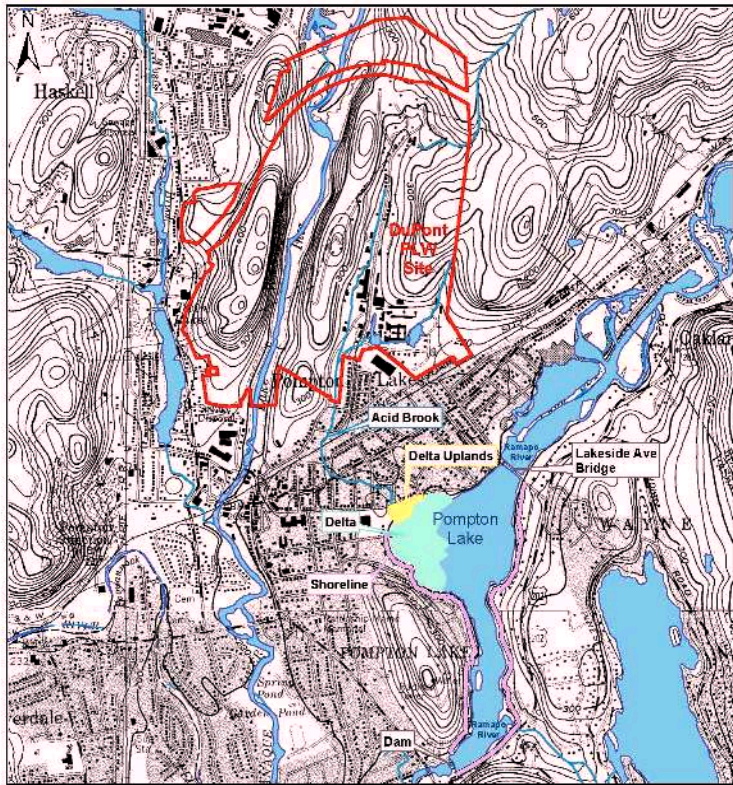
http://www.nj.gov/dep/srp/community/sites/dupont_pompton_lakes/more_site_info.htm

Mindy Mumford, Office of Community Relations, (609) 777-1976

For additional information about the permit modification and corrective action decision please contact Clifford Ng, Project Manager, EPA RCRA Programs Branch, at (212) 637-4113 or email: ng.clifford@epa.gov.

Attachments to the Statement of Basis:

- 1: Fig. 1 from the Permit Modification Application 4/2011 (Quadrant map)
- 2: Fig. 1A from the RASR 2009 (Areal Extent of ABD)
- 3: Fig. 2 from the Permit Modification Application 4/2011 (Uplands site plan)
- 4: Fig. 3 from the Permit Modification Application 4/2011 (ABD Remedial Approach)
- 5: Fig. 12 from the RASR 2009 (ABD sediment mercury concentration polygons)
- 6: Fig. 15 from the RASR 2009 (Remedial Alternative #4 – Removal)
- 7: Fig. Total Mercury Results 2003 – 2007, Fig 1-4 with the RAO in red.



0 0.125 0.25 0.5 0.75 1 Miles

Legend:

Base is portions of the
USGS Wanaque and
Pompton Plains QUAD.

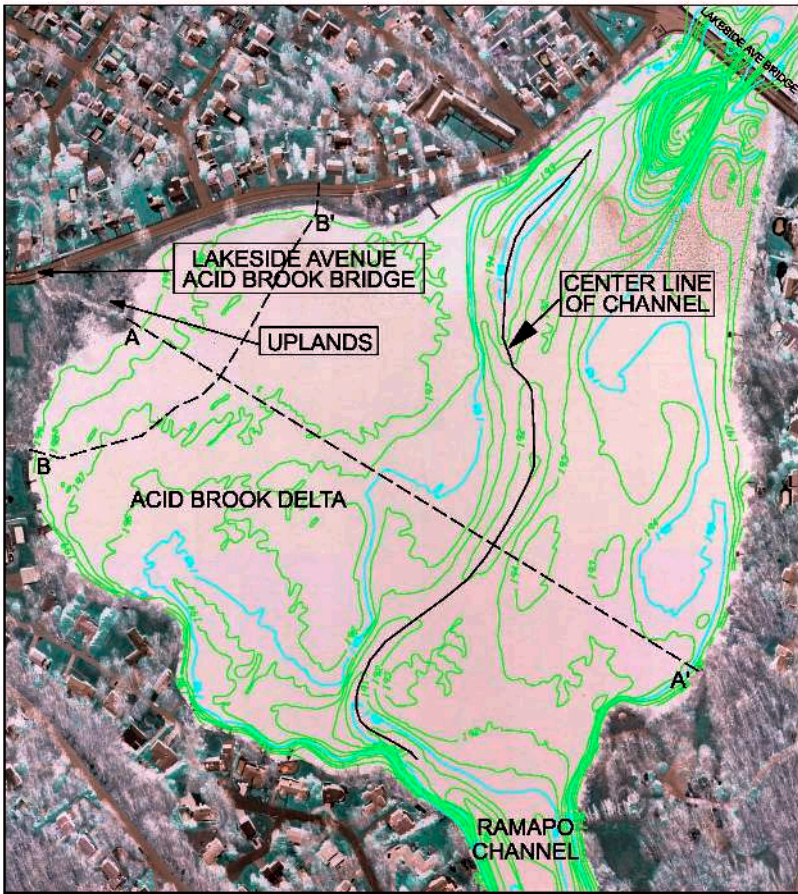
PARSONS

200 Cottontail Lane South
Somerset, New Jersey 08873

Site Location Map

**DuPont Pompton Lakes Works
Pompton Lakes, New Jersey**

Figure 1



LEGEND

Decorative: NPSO (in blue ink), based on April 2007 aerial photo collected by Geos Energy, Inc.

1 foot contour
5 foot contour

Scale: 1 inch = 500 feet
North is approx. per Survey of the Ramapo Avenue Bridge (NAD 83) and Topography (NAD 83) and 2007 and 2011.
Drawing: 2009071001-Fig. 101-A.jpg

DUPONT

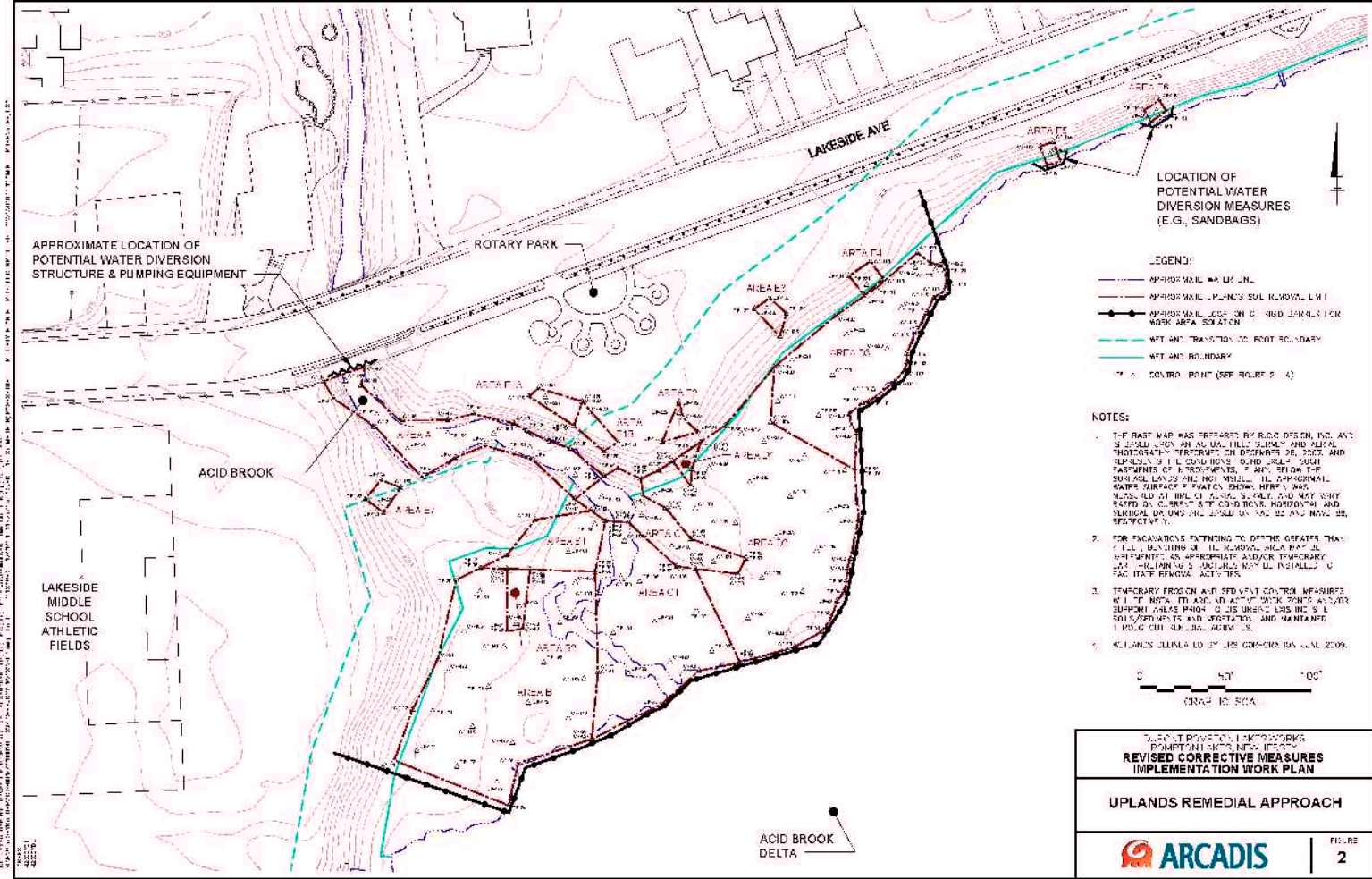
CORPORATE REMEDIATION GROUP
An Alliance Between DuPont and URS | Diamond Group

2009 Cresskill Hotel
Pompton Lakes, New Jersey

Aerial Extent of the Acid Brook Delta

Acid Brook Delta
DuPont Pompton Lakes Works

Figure 1A



APPROXIMATE LOCATION OF POTENTIAL WATER DIVERSION STRUCTURE & PUMPING EQUIPMENT

LAKESIDE MIDDLE SCHOOL ATHLETIC FIELDS

ROTARY PARK

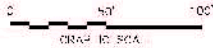
LAKESIDE AVE

ACID BROOK

LOCATION OF POTENTIAL WATER DIVERSION MEASURES (E.G., SANDBAGS)

- LEGEND:**
- APPROXIMATE MONITORING WELL
 - APPROXIMATE PLANNED SUBSURFACE MONITORING WELL
 - MONITORING WELL LOCATION
 - WFT AND TRANSITION POINT BOUNDARY
 - WFT AND BOUNDARY
 - ▲ CONTROL POINT (SEE FIGURE 2-4)

- NOTES:**
1. THIS MAP WAS PREPARED BY R.C.D. DESIGN, INC. AND IS BASED UPON AN ADEQUATE SURVEY AND OTHER INFORMATION RECEIVED IN DECEMBER 2005. DATE AND SURVEY DATA IS NOT GUARANTEED. THE USER SHALL BE RESPONSIBLE FOR VERIFYING THE DATA BEFORE THE SURVEY DATA IS USED FOR ANY OTHER PURPOSE. WATER SURFACE ELEVATIONS SHOWN HEREIN WAS TAKEN BY THE BUREAU OF LAND MANAGEMENT AND SHOULD BE USED AS A GENERAL REFERENCE. HORIZONTAL AND VERTICAL DATUMS ARE SHOWN ON EACH WELL AND SHALL BE RESPECTED.
 2. FOR ENCLOSURES EXTENDING TO THE OFFSETS THEREOF, UNLESS OTHERWISE INDICATED, THIS PLAN IS INTENDED AS AN APPROXIMATE GUIDE FOR TEMPORARY AND PERMANENT MEASURES. THE USER SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION AND DEPTH OF ANY TEMPORARY MEASURES.
 3. TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES WILL BE INSTALLED AND MAINTAINED AT ALL MONITORING WELLS. THE USER SHALL BE RESPONSIBLE FOR THE INSTALLATION AND MAINTENANCE OF ALL EROSION AND SEDIMENT CONTROL MEASURES.
 4. WELLPLUGS IDENTIFIED BY THE CORPORATION SHALL BE REMOVED.

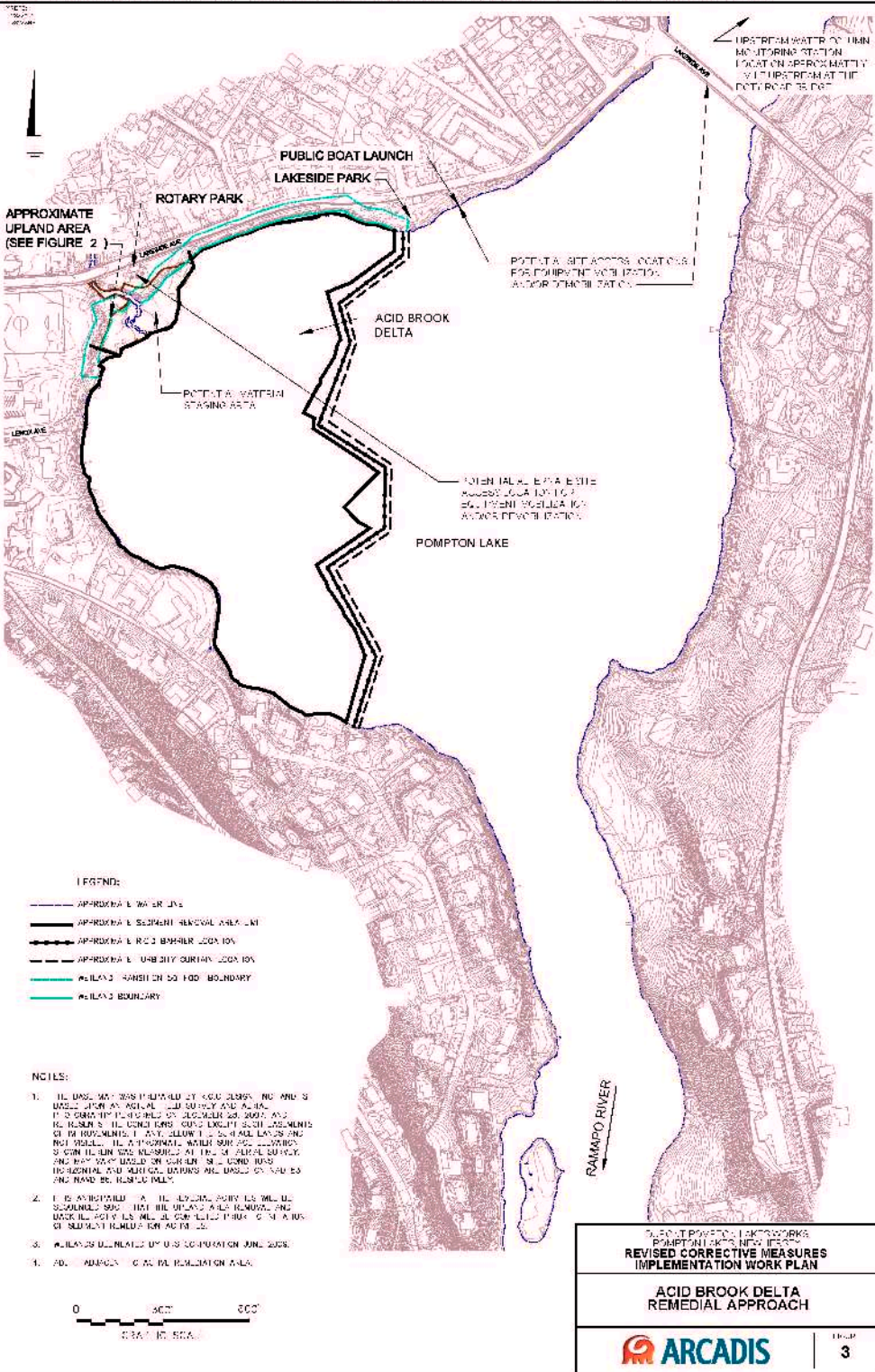


ACID BROOK DELTA

DEVELOPED BY: R.C.D. DESIGN, INC.
 10000 WILSON ROAD, SUITE 100
 REVISED CORRECTIVE MEASURES IMPLEMENTATION WORK PLAN

UPLANDS REMEDIAL APPROACH





DATE: 10/15/2024
 DRAWN BY: [redacted]

UPSTREAM WATER TREATMENT STATION LOCATION SPECIFICALLY UPSTREAM AT THE POTOMAC ROAD BRIDGE

APPROXIMATE UPLAND AREA (SEE FIGURE 2)

PUBLIC BOAT LAUNCH
 LAKESIDE PARK

ROTARY PARK

ACID BROOK DELTA

POTOMAC WATERWAY STAGING AREA

POTOMAC BRIDGE LOCATIONS FOR EQUIPMENT MOBILITY AND/OR STORAGE

WETLAND TRANSITION TO FOOD BOUNDARY
 WETLAND BOUNDARY

POMPTON LAKE

RAMAPO RIVER

LEGEND:

- APPROXIMATE WATER LINE
- APPROXIMATE SEWERAGE RECEIVAL AREA LINE
- APPROXIMATE ROAD BARRIER LOCATION
- APPROXIMATE URBAN CITY CURTAIN LOCATION
- WETLAND TRANSITION TO FOOD BOUNDARY
- WETLAND BOUNDARY

NOTES:

1. THIS DRAWING WAS PREPARED BY ARCADIS U.S. INC. AND IS BASED UPON AN AS-BUILT SURVEY AND AERIAL PHOTOGRAPHS DATED 08/20/2024. ANY CHANGES TO THIS DRAWING SHALL BE INDICATED BY A REVISION. THE CONTRACTOR SHALL VERIFY THE ACCURACY OF THE INFORMATION PROVIDED HEREON. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM ALL APPLICABLE AGENCIES AND AGENCIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM ALL APPLICABLE AGENCIES AND AGENCIES.
2. IT IS ANTICIPATED THAT THE DELTA AREA WILL BE SEPARATED FROM THE DELTA AREA THROUGH THE BACKFLOW PREVENTION VALVE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM ALL APPLICABLE AGENCIES AND AGENCIES.
3. WETLANDS Delineated by U.S. Department of the Interior.
4. ALL MEASUREMENTS SHALL BE IN FEET AND DECIMALS THEREOF.

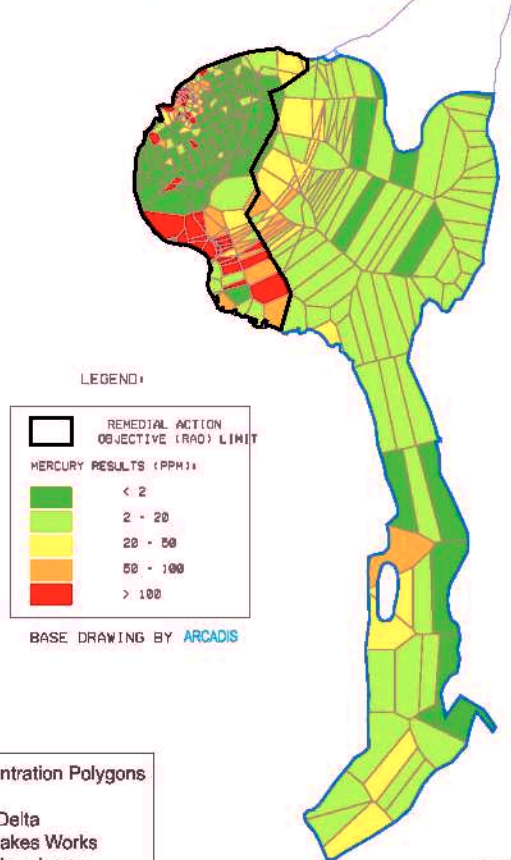
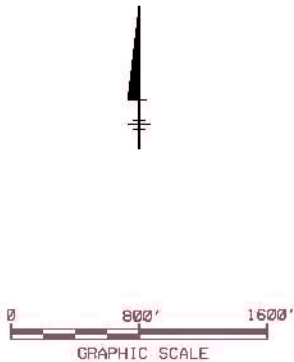
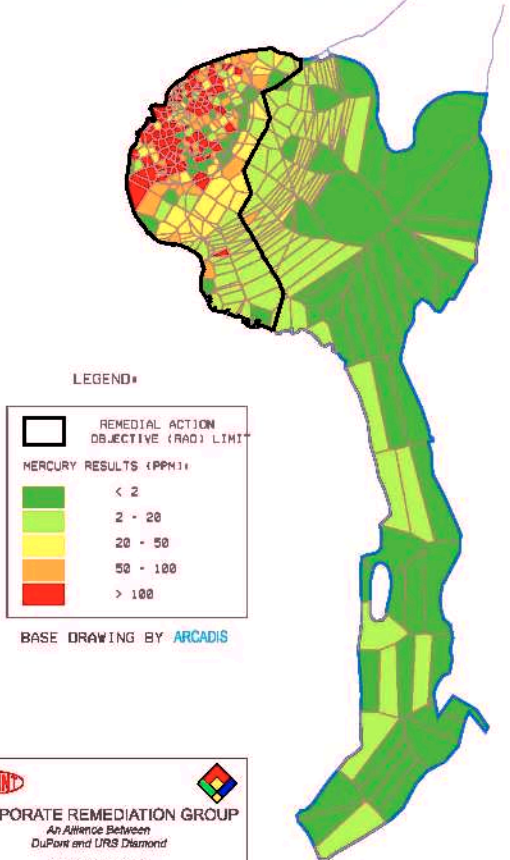
ARCADIS U.S. INC. | 1000 WEST 10TH AVENUE
 SUITE 1000 | DENVER, CO 80202
**REVISED CORRECTIVE MEASURES
 IMPLEMENTATION WORK PLAN**

**ACID BROOK DELTA
 REMEDIAL APPROACH**



SURFACE RESULTS (0-6 INCHES SEDIMENT THICKNESS)

SUBSURFACE RESULTS (>6 INCHES SEDIMENT THICKNESS)



Sediment Mercury Concentration Polygons

Acid Brook Delta
DuPont Pompton Lakes Works
Pompton Lakes, New Jersey

FIGURE 12

PROPERTY OF DU PONT DE NEMOURS CORPORATION. UNDER NO CIRCUMSTANCES TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPIING, RECORDING, BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, OR BY ANY INFORMATION SYSTEM, WITHOUT THE WRITTEN PERMISSION OF DU PONT DE NEMOURS CORPORATION. THIS DOCUMENT IS UNCLASSIFIED.

Attachment 7

