

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

UNITED STATES OF AMERICA,
and the STATE OF DELAWARE,

Plaintiffs,

v.

E.I. DU PONT DE NEMOURS AND COMPANY
and
CIBA SPECIALTY CHEMICALS
CORPORATION

Defendants.

CIV. NO. _____

CONSENT DECREE

I. INTRODUCTION

1. This Consent Decree is made and entered into by and among the United States of America (United States), on behalf of the Under Secretary for Oceans and Atmosphere of the National Oceanic and Atmospheric Administration (NOAA) acting on behalf of the Secretary of Commerce, the Secretary of the Department of the Interior (DOI) acting through the U.S. Fish and Wildlife Service (FWS), and the State of Delaware (State) through the Delaware Department of Natural Resources and Environmental Control (DNREC) (collectively, "the Trustees"); and E.I. du Pont de Nemours and Company and Ciba Specialty Chemicals Corporation (collectively, "DuPont").

2. The United States and the State have filed a complaint against DuPont seeking damages for injuries to natural resources, arising out of the releases of hazardous substances at manufacturing facilities, and adjacent waste disposal areas which received waste from the manufacturing facilities (hereinafter, "Plant Site"), owned, or formerly owned by E.I. du Pont de Nemours, and a portion of which is currently owned by Ciba Specialty Chemicals Corporation ("Ciba").

3. The Trustees have assessed injuries to natural resources resulting from Plant Site releases, focusing their investigation on an Assessment Area described below. The purpose of this Consent Decree is to fully and finally resolve Natural Resource Damage claims under section 107(a)(4)(c) and 107(f) of the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §§ 9607 (a)(4)(c) and 9607(f) (hereinafter referred to as "CERCLA") and the Delaware Hazardous Substance Cleanup Act (hereinafter referred to as "HSCA"), 7 Del. C. Ch. 91 with respect to the Assessment Area.

II. BACKGROUND

4. The approximately 120 acre Assessment Area, located in New Castle Co., Delaware is adjacent to and contains a portion of the Christina River, a sub-watershed in the Delaware River Estuary. The Assessment Area is located near the I-95, I-495, and Delaware State 141 interchange and consists of a pigment manufacturing plant, a former chromium dioxide production facility (DuPont Holly Run Plant), two inactive landfills separated by the Christina River, a small recreational area (Ballpark), a segment of the Christina River and associated wetlands. Hazardous substances found at the Assessment Area include arsenic, barium, cadmium, chromium, cobalt, copper, lead, manganese, mercury, silver, and zinc, all of which are

"hazardous substances" within the meaning of section 101(14) of CERCLA, 42 U.S.C. § 9601(14). The Assessment Area is the subject of the Damage Assessment and Restoration Plan (DARP) incorporated in this Consent Decree as Attachment A, and is depicted in the map attached to the Consent Decree as Attachment B.

5. E. I. Du Pont de Nemours purchased and operated an existing pigment manufacturing facility in 1929, and operated it until 1984 when it was acquired by Ciba. As part of the acquisition agreement, E. I. du Pont de Nemours agreed to indemnify Ciba for certain claims, including the claims in the Complaint. E. I. du Pont de Nemours continues to own the remainder of the Plant Site, and manufactured chromium dioxide powder at the Plant Site from 1978 until 1999.

6. In 1988, E. I. du Pont de Nemours entered into an Administrative Order on Consent (AOC) with the Environmental Protection Agency (EPA) to complete investigations for the Dupont Newport Superfund Site ("Superfund Site") in which the Assessment Area and Plant Site are located. The Superfund Site was included on the National Priorities List in early 1990. A Remedial Investigation/Feasibility Study (RI/FS) for the Superfund Site was conducted in three phases between August 1988 and 1992. In August 1993, a Record of Decision (ROD) was issued that specified remedial actions for seven operable units within the Superfund Site. A summary of the remedial actions undertaken pursuant to the ROD is included in the DARP.

7. Liability for damages to natural resources, pursuant to Section 107 of CERCLA, 42 U.S.C. §9607 shall be to the United States and the State for natural resources belonging to, managed by, controlled by, or appertaining to them. Liability for natural resources shall also be to the State pursuant to HSCA, 7 Del. C. Ch. 91. The United States and the State are authorized

to assess injuries to federal and state natural resources caused by releases of hazardous substances and to recover damages to: (1) restore, rehabilitate, replace or acquire the equivalent of the injured natural resources and (2) reimburse the Trustees for the reasonable costs of the damage assessment and restoration planning. All natural resource damage costs required to be paid under this Consent Decree are set forth in the "Summary of Costs" which is Attachment G to this Consent Decree.

8. The United States and the State share trusteeship of the injured resources in the Assessment Area. The Trustees determined that releases of hazardous substances to the wetlands, surface water, groundwater, sediments, and terrestrial habitats within the Assessment Area have resulted in injury to these natural resources, and that some of these injuries have continued post-remediation.

9. Pursuant to this Consent Decree, DuPont will (1) pay the costs for the Trustees to implement the projects in the DARP (Attachment A) to restore Assessment Area natural resources or their services; (2) purchase an Environmental Covenant from the landowner of private property outside the Assessment Area on which the restoration projects will be implemented (hereinafter "Pike Property"); (3) pay Damage Assessment Costs incurred by the Trustees; and (4) pay a damage claim to the State, and receive a credit from the State for prior work performed to extend access to a public water supply, as compensation for any remaining injuries to groundwater in the Assessment Area.

10. The Parties agree that the DARP and this Consent Decree represent a cooperative and collaborative process.

11. The Parties recognize, and the Court by entering this Consent Decree finds that this Consent Decree has been negotiated in good faith, that implementation of this Consent Decree will expedite the restoration of natural resources and will avoid prolonged and complicated litigation among the Parties, and that this Consent Decree is fair, reasonable, and in the public interest.

THEREFORE, it is ORDERED, ADJUDGED AND DECREED as follows:

III. JURISDICTION AND VENUE

12. The Court has personal jurisdiction over the Parties and has jurisdiction over the subject matter of this action pursuant to 28 U.S.C. §§ 1331 and 1345, and Sections 107 and 113(b) of CERCLA, 42 U.S.C. §§ 9607 and 9613(b) and HSCA, 7 Del. C. § 9105. Venue is proper in this Court pursuant to 28 U.S.C. § 1391(b) and Section 113(b) of CERCLA, 42 U.S.C. § 9613(b).

IV. PARTIES

13. The parties to this Consent Decree are the United States of America, on behalf of NOAA and DOI/FWS; the State of Delaware, on behalf of DNREC; and E. I. du Pont de Nemours and Company and Ciba Specialty Chemicals Corporation.

V. DEFINITIONS

14. Unless otherwise expressly provided herein, terms used in this Consent Decree which are defined in CERCLA, 42 U.S.C. § 9601 *et seq.*, or in regulations promulgated under CERCLA, 43 C.F.R. Part 11 and 40 C.F.R. Part 300, shall have the meaning assigned to them in CERCLA or in such regulations. Whenever terms listed below are used in this Consent Decree

or in the Attachments attached hereto and incorporated hereunder, the following definitions shall apply:

A. "Assessment Area" shall mean the area described in paragraph 4 above, depicted on the map attached to this Consent Decree as Attachment B, which is the subject of the restoration measures described in the DARP.

B. "Consent Decree" means this document entitled "Consent Decree," all attachments thereto, and any modifications made pursuant to Section XVII.

C. "Date of Entry" means the date on which this Consent Decree is entered by the Clerk of Court after the United States and the State have moved for entry and the District Court Judge has signed the Consent Decree.

D. "Date of Lodging" means the date that this Consent Decree is lodged with the Clerk of Court.

E. "Interest" shall mean interest accruing from the effective date of the Consent Decree, until the date of payment, at the rate set forth in 28 U.S.C. 1961. Interest shall be simple interest calculated on a daily basis;

F. "Parties" means the United States, the State, and DuPont.

G. "Damage Assessment Costs" means the costs incurred by the Trustees in assessing the natural resources actually or potentially injured, destroyed, or lost in the Assessment Area, and in identifying and planning for restoration actions to compensate for such injuries and losses. Such costs include administrative costs and other costs or expenses, direct and indirect, including but not limited to, the Trustee attorneys' costs incurred to support the assessment and restoration planning process.

H. "DARP" means the plan entitled "Damage Assessment and Restoration Plan, DuPont/Newport Assessment Area (and incorporated in this Consent Decree as Attachment A).

I. "Restoration Projects" shall mean the restoration actions comprised of, defined and described in the DARP (Attachment A).

J. "Superfund Site" shall mean the E.I /Newport Superfund Site which is the subject of the August 1993 ROD issued by EPA.

K. "Trustees" means for the United States - NOAA, DOI/FWS; and, for the State - DNREC.

L. "Natural Resource Damages" shall mean damages recoverable under section 107(a)(4)(c) and 107(f) of the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §§ 9607 (a)(4)(c) and 9607(f) (hereinafter referred to as "CERCLA") and the Delaware Hazardous Substance Cleanup Act (hereinafter referred to as "HSCA"), 7 Del. C. Ch. 91, by the United States and the State on behalf of the public for injury to, destruction of or loss of Assessment Area natural resources and the services they provide.

VI. APPLICABILITY OF CONSENT DECREE

15. The provisions of this Consent Decree shall apply to and be binding on the United States, the State and DuPont, their respective directors, employees, agents, predecessors, subsidiaries, affiliates, parents, successors, and assigns. No change in ownership, corporate or partnership status relating to DuPont including, but not limited to, any transfer of assets or real or personal property, shall in any way alter the responsibilities of DuPont under this Consent Decree.

VII. DAMAGE ASSESSMENT COSTS

16. Not later than 120 days after the Effective Date of this Consent Decree, DuPont shall reimburse each Trustee for its Damage Assessment Costs in the amounts specified below.

17. DuPont shall pay \$98,898.00 for Damage Assessment Costs incurred by DOI. The DOI Past Costs shall be paid by Electronic Funds Transfer (EFT) to the U.S. Department of Justice lockbox, referencing DOJ No. 90-11-2-883/2 and the United States Attorney's Office file number, in accordance with the EFT instructions that shall be provided by the United States Attorney's office after lodging of this Decree. Any EFT received at the United States Department of Justice lockbox after 4:00 p.m. (Eastern Time) will be credited on the next business day. Defendants shall simultaneously deliver copies of the EFT transmittal notice to the Chief, Environmental Enforcement Section, U.S. Department of Justice, P.O. Box 7611, Washington D.C. 20044, Attn: DOJ No. 90-11-2-883/2. Notice of the EFT shall be sent to the Parties as specified in Section IX, as well as to:

U.S. Department of the Interior
Natural Resource Damage Assessment and Restoration Program
Attention: Restoration Fund Manager
1849 C Street, NW
Mail Stop 4449
Washington, DC 20240

18. DuPont shall pay \$173,127.30 for Damage Assessment Costs incurred by NOAA. The NOAA Past Costs shall be paid by EFT to the U.S. Department of Justice lockbox, referencing DOJ No. 90-11-2-883/2 and the United States Attorney's Office file number, in accordance with the EFT instructions that shall be provided by the United States Attorney's office after lodging of this Decree. Any EFT received at the United States Department of Justice lockbox after 4:00 p.m. (Eastern Time) will be credited on the next business day. Defendants

shall simultaneously deliver copies of the EFT transmittal notice to the Chief, Environmental Enforcement Section, U.S. Department of Justice, P.O. Box 7611, Washington D.C. 20044, Attn: DOJ No. 90-11-2-883/2. Notice of the EFT shall be sent to the Parties as specified in Section IX, as well as to:

NOAA/NOS/OR&R
ATTN: Kathy Salter, DARRF Manager
1305 East West Highway
SSMC4, Room 9331
Silver Spring, MD 20910-3281, and

Sherry Krest
United States Department of the Interior
USFWS, CBFO
177 Admiral Cochrane Dr.
Annapolis, MD 21401

19. DuPont shall pay \$24,527.21 for Damage Assessment Costs incurred by the State. DuPont shall also pay the State \$8,000.00 towards the State's claim for injury to groundwater in the Assessment Area, and the State hereby grants DuPont a credit, in the amount of \$566,000.000 for work previously performed by DuPont to extend access to a public water supply, as compensation for any remaining injury to groundwater in the Assessment Area. Both amounts required to be paid under this paragraph may, at DuPont's discretion, be paid to DNREC in the form of one check for the combined amount. Checks for payments required by this paragraph should be made payable to DNREC HSCA account, and referenced as "DuPont Newport Site" and mailed to:

Attn: Jane Biggs
DNREC - SIRB
391 Lukens Dr.
New Castle, DE 19720

Notice of payment should be sent to:

Robert Kuehl
Deputy Attorney General
DNREC - SIRB
391 Lukens Dr.
New Castle, DE 19720

20. In the event that payments required by this Section are not made within 120 days of the entry of this Consent Decree by the Court, interest, at the interest rate specified in Paragraph 14 E , on the unpaid balance shall be paid commencing on the 121st day after entry of this Consent Decree and accruing through the date of payment. Payments of interest shall be in addition to such other remedies or sanctions available to the Trustees by virtue of DuPont's failure to make timely payments under this Section. DuPont shall make all payments of interest required by this Paragraph in the manner described in this Section.

VIII. NATURAL RESOURCE RESTORATION CREDITS AND REQUIREMENTS

21. The Parties agree that the release of hazardous substances resulted in injury to natural resources in riverine, riparian, wetland ecosystems and groundwater within the Assessment Area. Under the terms of the ROD, DuPont was required to install a new water supply line along a portion of Old Airport Road and provide water hook-ups to surrounding businesses and residences. DuPont volunteered to go beyond what the ROD required and extend the water supply line and hook ups to the end of Old Airport Road, at an additional cost of \$566,000.00. As compensation for its claim for injury to groundwater, the State has granted DuPont Natural Resource Damage credit in the amount of \$566,000.00 for improving access to a public water supply. Additionally, DuPont, in consultation with EPA, DNREC, NOAA and USFWS, performed the following measures during remediation to restore injured natural

resources associated with the North and South Wetlands in the Assessment Area: Stabilization of the river berm; shoreline erosion protection; sediment excavation to a depth of more than twice of what was required by the ROD; construction of a water control structure; sediment stabilization with erosion matting; and Phragmites control. These measures had the effect of improving drainageway habitat, increasing the amount of open water at high tide, improving water quality, and providing better forage and cover for fish and wildlife in the North and South Wetlands. The Trustees have determined that the restoration measures taken by Dupont improved the North and South Wetlands beyond their baseline condition. The Trustees have quantified these restoration measures in the DARP, and have credited DuPont accordingly for restoring injured natural resources in the Assessment Area.

22. In order to fully compensate the public for the lost use of Assessment Area natural resources between the time of the release and the time the Assessment Area resources were restored, DuPont has agreed to purchase an Environmental Covenant on the Pike Property and to fund certain restoration measures to be performed by the Trustees on the Pike Property as set forth in the DARP. The 56 acre Pike Property, located on the Kent and Sussex county line approximately 55 miles down Delaware Bay from the Christina River, includes upland and emergent tidal wetlands. Restoration of the Pike Property is expected to result in significant habitat improvements in the Mispillion River ecosystem. Natural resources such as blue crab, Atlantic herring, spot, and striped bass, use the entire Delaware estuary and its rivers (e.g., the Christina and Mispillion Rivers) as spawning and nursery areas. Therefore, the Trustees determined that the Delaware Estuary represented the relevant watershed for siting additional restoration actions that will fully compensate the public for the lost use of Natural Resources in

the Assessment Area. The habitat on the Pike Property closely resembles that of the Assessment Area. Therefore, selection of the Pike Property for restoration opportunities outside the Christina sub-watershed of the Delaware Estuary was determined by the Trustees to be appropriate.

23. Restoration Costs. Not later than 30 days after the Effective date of this Consent Decree, DuPont agrees to pay \$742,653.00 to the Trustees to be used by the Trustees to implement Restoration Projects in the Environmental Covenant area (Pike Property), as set forth in the DARP (Attachment A). This payment is expected to cover costs associated with the Restoration Projects, including costs for FWS to develop design documentation and performance measures to implement the DARP, as well as other costs including, but not limited to, Trustee oversight and monitoring, administration, and costs outside the DARP as described in paragraph 24 below. These funds shall be placed in an account in the Department of Interior's Natural Resource Damage Assessment and Restoration (NRDAR) Fund, and used in accordance with the "Agreement Among Trustees" (Attachment C). The NRDAR account will be known as the "DuPont Newport Account". Payment shall be made as follows:

U.S. Department of Interior
Natural Resource Damage Assessment and Restoration Program
Attention: Restoration Funds Manager
1849 C Street, NW
Mail Stop 4449
Washington D.C. 20240

24. Costs Outside the DARP. In the event that unanticipated conditions require actions outside the DARP to assure the success of the Restoration Projects, the FWS, as Lead Administrative Trustee, shall notify DuPont and provide documentation as to the need for the

proposed expenditure(s). DuPont shall be provided with an opportunity to comment or object within two weeks of receipt of such notice. If DuPont does not respond, FWS may assume DuPont has no objection and may use the funds for the activities described in the notice. If, however, FWS receives comments from Dupont, FWS will attempt to accommodate those comments when appropriate. Notwithstanding the notice requirement described herein, the Trustees will make the final decision as to whether to proceed with activities described in the notice.

25. Certification of Completion and Accounting. During the period of restoration construction as described in the DARP, DOI shall provide DuPont with a written accounting of monies spent from the NRDAR Fund DuPont Newport Account at least every sixty days. Within 90 days after the Trustees certify that restoration is complete, the Trustees shall provide notice to DuPont of such completion and a final written accounting of monies spent from the DuPont Newport Account. Any unspent monies from this account, including interest accumulated, shall be reimbursed to DuPont within 180 days of the notification of the certification that the restoration is complete.

26. Monitoring Plan. DuPont shall implement the Monitoring Plan (Attachment D) including all corrective actions, per Trustee oversight. The Parties may agree to modifications in the Monitoring Plan. All agreed upon modifications must be made in writing.

27. Environmental Covenant. In order to ensure that the restored natural resources and the services they provide are preserved in perpetuity, DuPont has entered into an agreement with William and Sharon Pike of 661 Shawnee Road, Milford Delaware 19963 to execute an Environmental Covenant. The Environmental Covenant for the Pike Property has been executed

and recorded in the deeds records of Sussex and Kent Counties, Delaware, and is Attachment E to this consent Decree. Within 60 days of the days after receipt of notice of certification that restoration is complete, DuPont shall pay the sum of \$50,000 to the Delaware Department of Fish and Wildlife for monitoring and maintenance of the Environmental Covenant on the Pike Property. Payment shall be made as described in paragraph 19, except that the check shall be referenced "DuPont Environmental Covenant."

IX. NOTICE

28. Whenever notice is required to be given by one Party to another, it shall be directed to the following individuals at the addresses specified below, unless otherwise specifically provided for in this Consent Decree. Any change in the individuals designated by any Party must be made in writing to the other Parties. All notices shall be sent by first-class mail.

For DOJ: Chief, Environmental and Enforcement Section
Environment and Natural Resource Division
U.S. Department of Justice
P.O. Box 7611
Ben Franklin Station
Washington, DC 20044-7611
DJ # 90-5-1-1-07673

For NOAA: Sharon Shutler, Esq.
NOAA Office of General Counsel
1315 East-West Highway, Room 15132
Silver Spring, MD 20910

For DOI: Mark Barash, Esq.
Office of the Solicitor
U.S. Department of the Interior
Suite 612
1 Gateway Center
Newton Corner, MA 02458

For DNREC: Jane Biggs
DNREC - SIRB

391 Lukens Dr.
New Castle, DE 19720

For Du Pont: Ralph G. Stahl, Jr., Ph.D., D.A.B.T.
Principal Consultant
DuPont Corporate Remediation Group
Barley Mill Plaza, Bldg. 19
Route 141 & Lancaster Pike
Wilmington, Delaware 19805

X. DISPUTE RESOLUTION

29. Unless otherwise expressly provided for in this Consent Decree, the dispute resolution procedure of this Section shall be the exclusive mechanism to resolve disputes arising under or with respect to this Consent Decree. However, the procedures set forth in this Section shall not apply to actions by the United States or the State to enforce obligations of DuPont that have not been disputed in accordance with this Section.

30. Informal Dispute Resolution. If, in the opinion of either the Trustees or DuPont, there is a dispute which arises under or with respect to this Consent Decree, that Party shall send written notice to the other Party or Parties outlining the nature of the dispute and requesting negotiations to resolve the dispute. The Parties shall endeavor to resolve the dispute through good faith negotiations. The period for informal negotiations shall not exceed 30 days from the date the notice is sent, unless this time period is modified by written agreement of the Parties. At any time during informal negotiations, the Parties may agree to take their dispute before a mutually agreed upon mediator. The outcome of the mediation, however, shall be non-binding.

31. Formal Dispute Resolution.

A. In the event that the Parties cannot resolve a dispute by informal negotiations under the preceding Paragraph, then the position advanced by the Trustees shall be considered binding unless, within 30 days after the conclusion of the informal negotiation period, DuPont invokes the formal dispute resolution procedures of this Section. DuPont shall invoke formal dispute resolution by serving the Trustees with a written Statement of Position on the matter in dispute including, but not limited to, any factual data, analysis, or opinion supporting that position and all supporting documentation relied upon by DuPont.

B. Within 60 days after receipt of Du Pont's Statement of Position, the Trustees will serve on DuPont their Statement of Position, including, but not limited to, any factual data, analysis, or opinion supporting that position and all supporting documentation relied upon by the Trustees. Within 15 days after receipt of this Statement of Position, DuPont may submit a Reply.

C. An administrative record of the dispute shall be maintained by the Trustees and shall contain all statements of position, including supporting documentation, submitted pursuant to this Section. Where appropriate, the Trustees may allow submission of supplemental statements of position by the Parties to the dispute.

D. The Trustees will issue a final decision resolving the dispute based on the administrative record described in Paragraph 31 C, above. This decision shall be binding on DuPont, subject only to the right to seek judicial review pursuant to Paragraph 31 E.

E. Any decision made by the Trustees pursuant to Paragraph 31 D, above, shall be reviewable by this Court, provided that a motion for judicial review of the decision is filed by

with the Court and served on all Parties within 10 days of receipt of the Trustees' decision. The motion shall include a description of the matter in dispute, the efforts made by the Parties to resolve it, the relief requested, and the schedule, if any, within which the dispute must be resolved to ensure orderly implementation of this Consent Decree. The Trustees may file a response to DuPont's motion.

F. In any judicial proceedings on any dispute governed by this Consent Decree, DuPont shall have the burden of demonstrating that the decision of the Trustees is not in accordance with the requirements of the Consent Decree, according to a standard of review based on applicable law. Judicial review of the decision of the Trustees shall be on the administrative record.

32. The invocation of informal or formal dispute resolution procedures pursuant to this Section shall not extend, postpone or affect in any way any obligation of DuPont under this Consent Decree that is not directly in dispute, unless the Trustees agree or the Court rules otherwise.

XI. COVENANTS NOT TO SUE BY THE UNITED STATES AND THE STATE

33. In consideration of the satisfactory performance by DuPont of all of the obligations under this Consent Decree, and except as specifically provided in Section XII, the United States and the State each hereby covenant not to sue or to take administrative action against DuPont for Natural Resource Damages at the Assessment Area. This covenant is effective upon fulfillment by DuPont of all the obligations contained in this Consent Decree.

**XII. RESERVATION OF RIGHTS BY THE UNITED STATES
AND THE STATE**

34. Notwithstanding any other provision of this Consent Decree, the United States and the State reserve the right to institute civil or administrative proceedings, as applicable, against DuPont in this action or in a new action, seeking recovery of additional Natural Resource Damages, if:

(i) new conditions, including the release of hazardous substances at or from the Plant Site that were previously unknown to the Trustees, are discovered; or

(ii) new information about the release of hazardous substances from the Plant Site that previously was unknown to the Trustees, in whole or in part, is received, and these previously unknown conditions or this information, together with any other relevant information, indicates that there are new or additional injuries to, destruction of, or losses of natural resources or new or additional natural resource service losses that were unknown to the Trustees when they issued the DARP.

35. Information and conditions known to the Trustees shall include only the information and conditions set forth in Attachment F.

36. Nothing in the Consent Decree is intended to be, nor shall be construed as, a release from liability or a covenant not to sue for any claim or cause of action, administrative or judicial for the following:

A. DuPont's failure to meet its obligations contained in this Consent Decree;

B. Claims brought on behalf of the U.S. or Delaware, other than for Natural Resource Damages that are the subject of this Consent Decree;

C. Liability arising from any past, present, or future releases of hazardous substances resulting in injuries to natural resources outside the Assessment Area;

D. Liability arising from any releases of hazardous substances from any site or location that is not the subject of this Consent Decree, including, but not limited to, any hazardous substance taken from the Assessment Area and disposed of at another site or location;

E. Liability for violations of Federal or State law which occur during or are incident to the implementation and/or monitoring of the Restoration Projects;

F. Any and all criminal liability; and

G. Any matter not expressly included in the covenant not to sue for Natural Resource Damages set forth in Section XI.

XIII. COVENANTS BY DUPONT

37. DuPont hereby covenants not to sue and agrees not to assert any claims or causes of action against the U.S. and State of Delaware for any claims arising from or relating to the Restoration Projects or any claims arising from or relating to Natural Resource Damages, pursuant to any Federal, State, or common law, including, but not limited to the following:

A. any direct or indirect claim for reimbursement from the Hazardous Substance Superfund (established pursuant to the Internal Revenue Code, 26 U.S.C. § 9507) through Sections 107, 111, 112, and 113 of CERCLA, 42 U.S.C. §§ 9607, 9611, 9612, and 9613, or any other provision of State or Federal law; or

B. any claims arising out of activities related to the Restoration Projects, including without limitation, claims based on the Trustees' selection of the Restoration Projects, oversight of the Restoration Projects, and/or approval of plans for such activities.

38. DuPont hereby covenants not to oppose entry of this Consent Decree by this Court or to challenge any provision of this Consent Decree unless the United States or the State provide written notice that one or both of them no longer supports entry of the Consent Decree.

39. Notwithstanding any other provision of this Consent Decree, this Consent Decree is without prejudice to all rights of DuPont with respect to all matters other than those expressly specified in the covenants set forth in this Section.

XIV. EFFECT OF SETTLEMENT/CONTRIBUTION PROTECTION

40. Nothing in this Consent Decree shall be construed to create any right in, or grant any cause of action to, any person not a Party to this Consent Decree. Each of the Parties expressly reserves any and all rights (including, but not limited to, any right of contribution), defenses, claims, demands, and causes of action which each party may have with respect to this release of hazardous substances against any person not a Party hereto.

41. In any subsequent administrative or judicial proceeding initiated by the United States or Delaware pursuant to Section XII, DuPont shall not assert, and may not maintain any defense or claim based on the principles of waiver, res judicata, collateral estoppel, issue preclusion, claim-splitting, statute of limitations, or any other defenses based upon the contention that the claims raised by the Trustees in the subsequent proceeding were or should have been brought in the instant case, provided, however, that nothing in this Paragraph affects the enforceability of the covenant not to sue set forth in Section XI. In the event the United States or Delaware initiates a subsequent administrative or judicial proceeding pursuant to Section XII, DuPont expressly reserves all other potential defenses to such administrative or judicial proceeding.

42. The Parties agree, and by entering into this Consent Decree this Court finds, that as of the date of this Consent Decree DuPont is entitled, to protection from contribution actions or claims as provided by Section 113(f)(2) of CERCLA, 42 U.S.C. § 9613(f)(2), and HSCA, 7 Del. C. §9107(c) for Natural Resource Damages at this Site.

XV. CERTIFICATION

43. Each undersigned representative of a Party to this Consent Decree certifies that he or she is fully authorized to enter into the terms and conditions of this Consent Decree and to execute and legally bind such Party to this document.

XVI. VOIDABILITY

44. If for any reason the District Court should decline to approve entry of this Consent Decree in the form presented, or if the United States or the State withdraws its consent pursuant to Section XX, this Consent Decree and the settlement embodied herein shall be voidable by written notice to the other Parties at the sole discretion of any Party to this Consent Decree, and the terms hereof may not be used as evidence in any litigation.

XVII. MODIFICATION

45. Any material modification to the DARP (Attachment A) may be made by written agreement between the Trustees and DuPont, or in accordance with the dispute resolution process, as provided in Section X.

46. Any modification that materially alters a requirement of this Consent Decree, other than requirements of the DARP, must be approved by the Court.

XVIII. COMPLIANCE WITH OTHER LAWS

47. This Consent Decree shall not be construed in any way to relieve DuPont or any other person or entity from the obligation to comply with any Federal, State, or local law.

XX. RETENTION OF JURISDICTION

48. This Court retains jurisdiction over both the subject matter of this Consent Decree and the Parties for the duration of the performance of the terms and provisions of this Consent Decree for the purpose of enabling any of the Parties to apply to the Court at any time for such further order, direction, and relief as may be necessary or appropriate for the construction or material modification of this Consent Decree, or to effectuate or enforce compliance with its terms.

XXI. LODGING AND OPPORTUNITY FOR PUBLIC COMMENT

49. The Parties agree and acknowledge that final approval by the United States and the State and entry of this Consent Decree (including Attachments) is subject to a thirty-day (30) period for public notice and comment in accordance with U.S. Department of Justice policy. The United States and the State reserve the right to withdraw or withhold their consent if comments regarding the Consent Decree disclose facts or considerations that indicate that the Consent Decree is inappropriate, improper, or inadequate. DuPont consents to the entry of this Consent Decree without further notice.

XXII. TERMINATION

50. Any Party may apply to the Court to terminate this Consent Decree after:

(A) All costs have been paid as provided in Sections VII and VIII;

(B) All restoration and monitoring actions are completed as provided for in Section VIII;
and

(C) All requirements related to the Environmental Covenant as set forth in Section VIII
have been completed.

XXIII. EFFECTIVE DATE

51. This Consent Decree shall be effective upon the Date of Entry by the Court.

XXIV. SIGNATORIES/SERVICE

52. DuPont shall identify, on the attached signature page, the name, address and telephone number of an agent who is authorized to accept service of process by mail on their behalf with respect to all matters arising under or relating to this Consent Decree. DuPont hereby agrees to accept service in that manner and to waive the formal service requirements set forth in Rule 4 of the Federal Rules of Civil Procedure and any applicable rules of this Court, including, but not limited to, service of a summons.

53. This Consent Decree may be executed in any number of counterparts and, as executed, shall constitute one agreement binding on all of the Parties hereto, even though all of the Parties do not sign the original or the same counterpart.

XXIII. FINAL JUDGMENT

54. This Consent Decree and its Attachments constitute the final, complete, and exclusive agreement and understanding among the Parties with respect to the settlement embodied in the Consent Decree. The parties acknowledge that there are no representations, agreements or understandings relating to the settlement other than those expressly contained in this Consent Decree. The Attachments to this consent decree are as follows:

Attachment A - DARP

Attachment B - Map of Assessment Area

Attachment C - Agreement Among Trustees

Attachment D - Monitoring Plan

Attachment E - Environmental Covenant

Attachment F - Information and Conditions known to the Trustees

Attachment G - Summary of Costs

55. Upon approval and entry of this Consent Decree by the Court, this Consent Decree shall constitute a final judgment between and among the United States, the State, and DuPont.

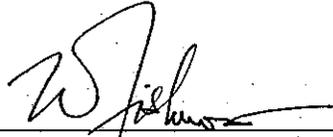
SO ORDERED THIS _____ DAY OF _____, 2006.

UNITED STATES DISTRICT JUDGE

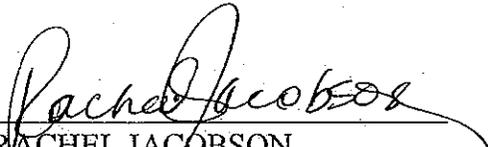
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DATE: 8/11/06


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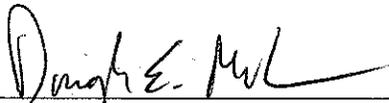
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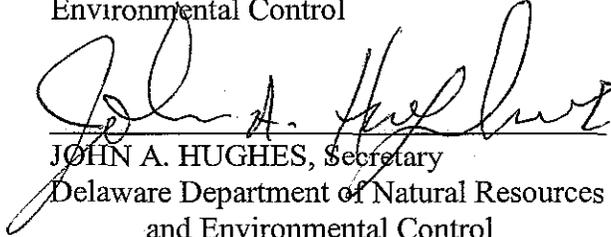
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Delaware Department of Natural Resources and
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and COMPANY:

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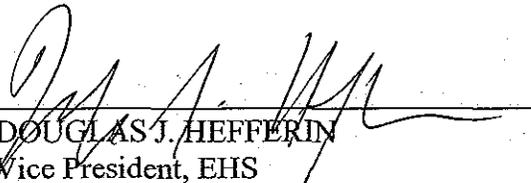
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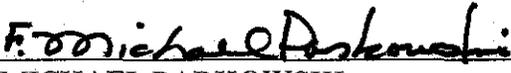
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DOUGLAS J. HEFFERIN
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On behalf of Ciba Specialty Chemicals Corporation and
Ciba-Geigy Corporation, the previous owner of the Ciba
portion of the Site.

DATE: August 1, 2006


F. MICHAEL PARKOWSKI
Parkowski, Guerke & Swayze, P.A.
116 W. Water Street
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ATTACHMENT A
DAMAGE ASSESSMENT AND RESTORATION PLAN

United States of America and the State of Delaware

v.

**E. I. du Pont de Nemours and Company &
Ciba Specialty Chemicals Corporation**

Consent Decree

2006

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**Damage Assessment and Restoration Plan/Environmental
Assessment
for the
DuPont Newport Superfund Site, Newport, Delaware**

May 2006

Prepared by:

**National Oceanic and Atmospheric Administration
Delaware Department of Natural Resources and Environmental Control
and
The United States Fish and Wildlife Service
on behalf of the
U.S. Department of the Interior**

Send Comments to:

Jane Biggs Sanger
Delaware Department of Natural Resources and Environmental Control
Division of Air and Waste Management
Site Investigation and Restoration Branch
391 Lukens Drive
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1.0 INTRODUCTION

This Draft Damage Assessment and Restoration Plan/Environmental Assessment (Draft DARP/EA) has been developed by the Delaware Department of Natural Resources and Environmental Control (DNREC), the National Oceanic and Atmospheric Administration (NOAA) of the U. S. Department of Commerce, and the United States Fish and Wildlife Service (USFWS) on behalf of the U.S. Department of the Interior (DOI), (collectively, "the Trustees") to address natural resources, including ecological services, injured, lost, or destroyed due to releases of contamination from the DuPont Newport Superfund Site ("Newport Site" or "Site") in New Castle County, Delaware.

The Draft DARP/EA identifies the restoration action(s) taken by DuPont as part of the site remediation, and actions that the Trustees would prefer to implement as part of a natural resource settlement that the Trustees jointly recovered for natural resource damages attributed to the Newport Site. The natural resource settlement is the result of a cooperative natural resource damage assessment between E.I. du Pont de Nemours and Company (DuPont) and the Trustees. During this cooperative process, the Trustees and DuPont reached a mutually acceptable natural resource damages settlement. In this proposed damage assessment and restoration plan, the Trustees' natural resource damages claim is to be compensated, in part, by the DuPont restoration activities that were completed at the time of the remedial action. In addition, DuPont will provide funding to implement the preferred alternative and purchase a conservation easement on property in Delaware. The restoration and funding thereof will be overseen by the Trustees pursuant to a Consent Decree (hereafter, "Consent Decree"). Under applicable laws and the terms of the Consent Decree, the damages to be recovered by the Trustees may only be used to plan, implement and oversee a plan providing for the preservation and enhancement of tidal wetlands as a means of restoring natural resources and services comparable to those injured or lost. In this case, the natural resource damages will be compensated in terms of the restoration and enhancement of the tidal wetlands at the Newport Site, and in Milford, Delaware, the preservation and enhancement of tidal wetland habitat and its services under Trustee supervision.

1.1 AUTHORITY

This Draft DARP/EA was prepared jointly by the Trustees pursuant to their respective authority and responsibilities as natural resource trustees under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 U.S.C. § 9601 *et seq.*; the Federal Water Pollution Control Act, 33 U.S.C. § 1251, *et seq.* (also known as the

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Clean Water Act or CWA), and other applicable federal or state laws, including Subpart G of the National Oil and Hazardous Substances Contingency Plan (NCP), at 40 C.F.R. §§ 300.600 through 300.615, and DOI's CERCLA natural resource damage assessment regulations at 43 C.F.R. Part 11 (NRDA regulations) which provide guidance for this restoration planning process under CERCLA.

1.2 NEPA COMPLIANCE

Actions undertaken by the Trustees to restore natural resources or services under CERCLA and other federal laws are subject to the National Environmental Policy Act (NEPA), 42 U.S.C. § 4321 *et seq.*, and the regulations guiding its implementation at 40 C.F.R. Parts 1500 through 1517. In general, federal agencies contemplating implementation of a major federal action must produce an environmental impact statement (EIS) if the action is expected to have significant impacts on the quality of the human environment. When it is uncertain whether a contemplated action is likely to have significant impacts, federal agencies prepare an environmental assessment (EA) to evaluate the need for an EIS. If the EA demonstrates that the proposed action will not significantly impact the quality of the human environment, the agency issues a Finding of No Significant Impact (FONSI), which satisfies the requirements of NEPA, and no EIS is required. For a proposed restoration plan, if a FONSI determination is made, the Trustees may then issue a final restoration plan describing the selected restoration action(s).

In accordance with NEPA and its implementing regulations, this Draft DARP/EA

- Summarizes the current environmental setting and that resulting from the restoration activities,
- Describes the purpose and need for additional restoration actions,
- Identifies alternative actions, assesses their applicability and potential impact on the quality of the physical, biological and cultural environment, and
- Summarizes the opportunity the Trustees provided for public participation in the decision-making process.

Based on the draft EA integrated into this Draft DARP/EA, the federal Trustees – NOAA and USFWS – have determined that the proposed restoration actions do not meet the threshold requiring an EIS, and barring public comments on this Draft DARP/EA, a Finding of No Significant Impact will be issued.

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1.3 PUBLIC PARTICIPATION

The Trustees have prepared this Draft DARP/EA to:

- Provide the public with information on the natural resources injuries and services losses assessed in connection with the Site,
- Present the restoration already completed on the part of DuPont,
- Provide the restoration objectives which have guided the Trustees in developing this plan,
- Present the restoration alternatives which have been considered, and
- Discuss the process used by the Trustees to identify preferred restoration alternatives and the rationale for their selection.

Public review of the restoration plan proposed in this Draft DARP/EA is an integral and important part of the restoration planning process and is consistent with all applicable state and federal laws and regulations, including NEPA and its implementing regulations, and the guidance for restoration planning found within 40 C.F.R. Part 11.

The restoration plan proposed in this Draft DARP/EA is being made available for review and comment by the public for a period of 30 days. The deadline for submitting written comments on the Draft DARP/EA is specified in one or more public notices issued by the Trustees to announce its availability for public review and comment. Comments are to be submitted in writing to:

Jane Biggs Sanger
Delaware Department of Natural Resources and Environmental Control
Division of Air and Waste Management
Site Investigation and Restoration Branch
391 Lukens Drive
New Castle, Delaware 19720
Voice: 302 395-2600
Fax: 302-395-2601

The Trustees will consider all written comments received prior to approving and adopting a Final Damage Assessment and Restoration Plan/Environmental Assessment (Final DARP/EA). Written comments received and the Trustees' responses to those comments, whether in the form of plan revisions or written explanations, will be summarized in the Final DARP/EA.

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1.4 ADMINISTRATIVE RECORD

The Trustees have maintained records documenting the information considered and actions taken by the Trustees during this restoration planning process, and these records collectively comprise the Trustees' administrative record (AR) supporting this Draft DARP/EA. Information and documents, including any public comments submitted on this Draft DARP/EA as well as the Final DARP/EA, are included in this AR as received or completed. These records are available for review by interested members of the public. Interested persons can access or view these records at the offices of:

Delaware Department of Natural Resources and Environmental Control
Division of Air and Waste Management
Site Investigation and Restoration Branch
391 Lukens Drive
New Castle, Delaware 19720
Phone: 302-395-2600
Fax: 302-395-2601

Arrangements must be made in advance to review or to obtain copies of these records by contacting the person listed above. Access to and copying of these records are subject to all applicable laws and policies including, but not limited to, laws and policies relating to copying fees and the reproduction or use of any material that is copyrighted.

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2.0 PURPOSE AND NEED FOR RESTORATION

This section generally describes the Site, summarizes the response actions which were undertaken, summarizes the Trustees' assessment of resource injuries and compensation requirements related to the Site, and provides more detailed information on the physical, biological, and cultural environments in the area affected by releases of contaminants from the Site.

2.1 OVERVIEW OF THE SITE

The Newport Site is located along the Christina River in Newport, Delaware near the I-95, I-495, and Delaware State 141 interchange. The approximately 120-acre Site consists of a pigment manufacturing plant now owned by CIBA Specialty Chemicals Corporation (CIBA), a former chromium dioxide production facility (DuPont Holly Run Plant), two inactive landfills separated by the Christina River, a small recreational area (Ballpark), and associated wetland areas and segment of the Christina River. (Figure 2-1)

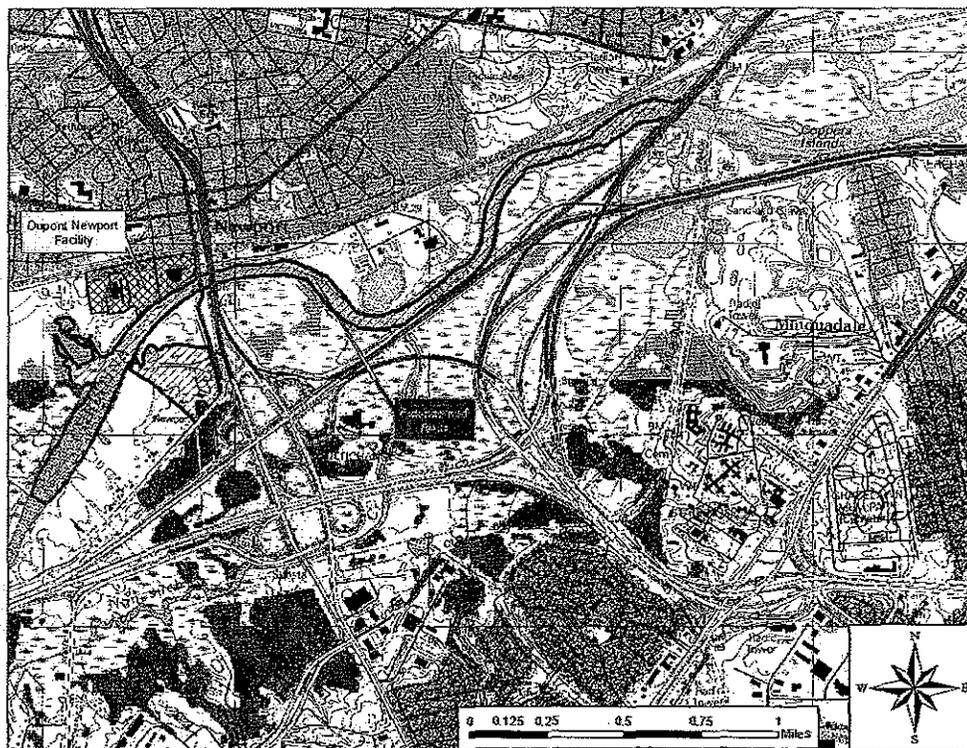


Figure 2-1 - The DuPont Newport Superfund Site, New Castle County, Delaware

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Pigment manufacturing began at the Site in 1902 when the site was owned and operated by Henrik J. Krebs. Krebs manufactured Lithopone, a white inorganic pigment, until 1929 when DuPont purchased the plant. Lithopone was produced until approximately 1952. The site then transitioned to manufacturing titanium dioxide as a paint pigment. DuPont also manufactured copper phthalocyanine (CPC) and quinacridone (QA), both organic pigments. Historical operations also included the production of chromium dioxide, high-purity silicon, and other organic and inorganic pigments. The pigment manufacturing operations were purchased by CIBA-GEIGY in 1984 and continue to operate today. DuPont retained the chromium dioxide magnetic recording tape operation at the Holly Run Plant. However, the Holly Run Plant ceased operation in 2000.

During plant operations, two portions of the site bordering the Christina River were used as waste disposal landfills. Landfilling occurred in the North Disposal site and the South Disposal site. The North Disposal site (approximately 7.6 acres) was used for disposal of general refuse and process waste from early 1902 until 1974. After disposal ceased in 1974, the North Disposal site was capped with approximately 2 feet of clayey material. The South Disposal site (approximately 17 acres) was operated from approximately 1902 to 1953. Material deposited in this landfill primarily consisted of insoluble residues of zinc and barite ores that were pumped as slurry through a pipeline across the Christina River.

Two organic pigments (CPC and QA) were manufactured at the site between 1948 and 1958. The presence of tetrachloroethene (PCE) and trichloroethene (TCE) in the soil and groundwater is believed to be associated with the historical use of these organic solvents in the production of these pigments.

In 1987, the United States Environmental Protection Agency ("EPA") proposed the inclusion of the Site to the National Priorities List ("NPL") based on the release or threatened release of contaminants, making it a priority Site for investigation and potential clean-up under CERCLA. The site was listed in 1990. In 1988, DuPont entered into an Administrative Order by Consent with EPA whereby DuPont agreed to perform a Remedial Investigation and Feasibility Study (RI/FS) for the site. The RI/FS was conducted between August 1988 and August 1992. The EPA Record of Decision was released in August 1993. A Remedial Design/Remedial Action Work Plan was completed in 1994 (DuPont Environmental Remediation Services, 1994). The Site was broken down into 7 operable units. Remedial actions began in 1996 and were completed in 2002.

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Human Use Characteristics

Current land uses at the Site include: CIBA manufacturing operations, a pump and treat system on the former Holly Run Plant, landfills, wetlands, and wooded upland areas. Manufacturing operations are located to the north of the Christina River. Access to the northern part of the Site is restricted by CIBA security. Access to the areas south of the Christina River is restricted by institutional controls (i.e., fencing and vegetative barrier). The existing land uses at CIBA, Newport-associate landfills and wetlands are expected to continue indefinitely.

Surface Water Characteristics

The surface water hydrology in the area of the Newport Site is highly influenced by the tidal water flow of the Christina River with a tidal range of approximately 4 to 5 feet. Surface water characteristics are different for both the North and South Wetlands, and have changed as a result of the remedial and restoration activities. Remedial/restoration activities completed at the site have enhanced both the retention and tidal water exchange within these wetland areas.

Prior to remedial activities, the North Wetlands consisted mostly of high marsh habitat (Figure 2-2). The marsh was inundated by high tides, except when the river base flow was low. At low tide, the North Wetlands would drain completely. Typically, the marsh would be regularly inundated only for several days during the spring high tides. The restoration of the North Wetlands provided a permanent pool of water by removal of additional sediment material and the construction of a water control structure at the river berm. This design allowed the wetland to be inundated daily with high tide. Re-enforcement/stabilization of the river berm ensured the longer-term protection of the wetlands. (Figure 2-3)

The South Wetlands mostly consisted of high marsh habitat. During the Remedial Investigation, potential sources of water for the wetlands were considered to be precipitation, groundwater discharge, and surface runoff. During the Remedial Design phase, it was discovered that the South Wetlands were tidally influenced. River water would enter into the wetlands from culverts located under Old Airport Road. Water would then slowly exit at these culverts or through the tidal gate directly into the Christina River. (The tide gate restricts inflow but allows outflow.) The monotypic stand of *Phragmites* concealed the tidal water flow through the wetlands. In addition, the dense root mass and stand of *Phragmites* throughout the wetland area restricted water movement through the wetland area (Figure 2-4). Similar to the North Wetlands, the marsh was inundated by high tides, except when the river base flow was low.

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Figure 2-2. North Wetlands – Pre-remediation

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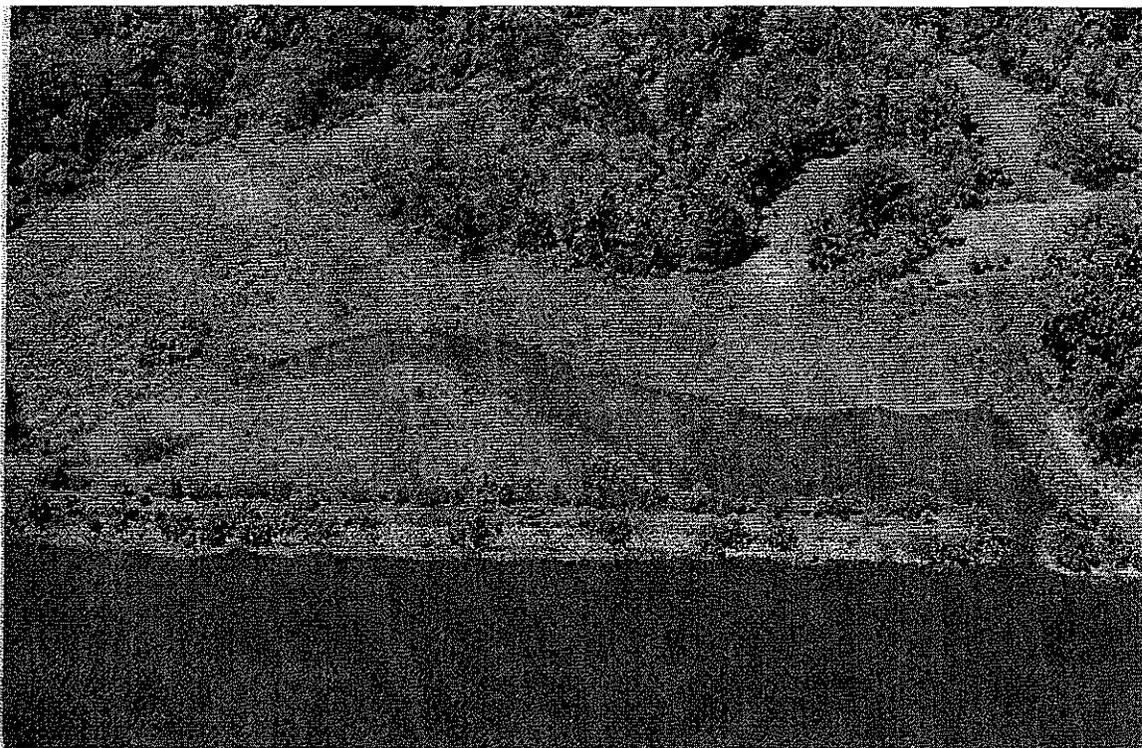


Figure 2-3 - North Wetlands – Post Restoration

A raised upland berm extended across the marsh from east to west and bisected the emergent marsh into a northern non-tidal portion and a southern tidal portion. Permanent standing water within the South Wetlands was limited to the South Pond. The South Pond, located north of the berm, was approximately two feet deep and one acre in size. The pond was isolated from adjacent drainages and was engulfed by a dense stand of *Phragmites*. In the warmer months, the surface water in the pond was choked with spatterdock and duckweed. Precipitation, groundwater discharge, and surface runoff were the primary sources of water for the pond. Because it is isolated from the adjacent drainages, the pond had limited recruitment of, and establishment of indigenous fish populations (Woodward-Clyde, 1992).

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Figure 2-4 - South Wetland – Pre-remediation (looking from the S).

During the remediation of the South Wetlands, portions of the berm up to 11 feet in depth were removed to create hummocks. Berm removal resulted in the opportunity to open the South Pond to tidal influence. The South Pond did not require remediation, however two feet were excavated to remove fine-grained sediments. It also was recontoured to provide a more gradual intertidal zone that was vegetated with emergent vegetation forms. Drainage features were added to facilitate sufficient water storage between high-tide cycles and develop more direct access to improve the tidal exchange throughout the South Wetlands. Tidal habitat was significantly improved by the removal of additional materials from the wetlands, berm, and South Pond areas, in conjunction with the enhancement of drainage features (Figure 2-5).

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Figure 2-5 - South Wetlands – Post Restoration (looking from the SE).

Habitat Characteristics

Pigment manufacturing continues at the CIBA Plant on the north side of the Christina River. The former Holly Run Plant has been reduced to an office trailer and a warehouse that contains the groundwater pump and treatment operation for the Site. As part of the ROD, the manufacturing areas have been paved to minimize infiltration. The North and South Landfill areas also have been covered as part of the ROD requirements and have been planted with warm season grasses. The Ballpark is located off-site. A small quantity of soil was removed as part of the remedial action. The Ballpark is currently owned by the City of Newport and is being used for recreational activities. The remaining property consists of the North and South Wetlands that are bisected by the Christina River.

Prior to remedial activities, the North and South Wetland areas were classified as high marsh. Surface water exchange and influence by the tidal waters of the Christina River were limited. The vegetation within these wetlands was typical for the Christina River watershed. *Phragmites* dominated a large portion of the North Wetlands and almost the entire South Wetlands. The remainder consisted largely of a simple herbaceous layer with limited

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vegetation strata and cover types. Because of this limited strata, cover types, and open water, the potential functional capacity for wildlife was limited. Dense stands of *Phragmites* also provided limited benefit to wildlife and eliminated vegetation of higher wildlife value (DuPont Environmental Remediation Services 1997a, and 1997b).

Remedial and restoration activities greatly enhanced the overall habitat, providing a higher functioning wetland habitat that continues to improve over time. DuPont proactively evaluated and incorporated additional restoration options beyond those required in the ROD. As part of this process, DuPont met with representatives of the United States Environmental Protection Agency, Delaware Department of Natural Resources and Environmental Control (DNREC), National Oceanic and Atmospheric Administration (NOAA), and the United States Fish and Wildlife Service (USFWS) to define additional potential restoration options that would be considered valuable to the stakeholders. The identified restoration options were then evaluated using the Evaluation of Planned Wetlands (EPW) to develop a restoration plan that best balanced the different potential wetland functions. Descriptions of the current North and South Wetlands are provided below.

North Wetlands

The North Wetlands now consist of equal proportions of high and low marsh habitat that includes four cover types. Palustrine Emergent Marsh (PEM) is the dominant cover type and includes mudflats that are exposed a low tide, and aquatic beds that support rooted and submerged aquatic vegetation. The marsh is regularly inundated by high tides and contains a permanent pool. The *Phragmites* control program has been successful in minimizing its presence. Vegetation within the North Wetlands has become increasingly more diverse structurally with added strata, cover types, and greater vegetation/water interspersions. The plant community species richness for the entire North Wetlands is composed of 88 taxa (10 planted species and 78 naturally recruited species). This species richness greatly surpasses that observed in the reference area (Banning Marsh) in which only 39 species were noted (DuPont Corporate Remediation Group (CRG), 2002a).

Successful restoration of the North Wetland has vastly improved the functional capacity of this wetland to support fish communities in the Christina River. Fisheries surveys conducted in 1999, 2001, and 2002 have proven that the North Wetland supports a healthy diverse fish community comprised of freshwater and estuarine species. The installation of a water control structure has successfully created a tidal open water habitat that maintains a continuous pool of water within the North Wetland and also allows for tidal flushing back into dense and diverse marsh vegetation. The increased (and increasing) complexity of this

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habitat type within the marsh provides niches for fish from all life stages (mature, mature spawning, juvenile, young-of-the-year, and larval fish). Currently, fisheries survey results suggests that one of the North Wetland's primary functions is a fish community nursery area. The collection of fishes from all life stages indicates that the aquatic habitat also functions as spawning and feeding grounds for numerous species. Overall, the abundance and structure of this fish community clearly demonstrate that the North Wetlands have been successfully restored to a level where the aquatic habitat now functions as an integral part of fisheries development and recruitment within the Christina River Watershed. (DuPont CRG, 2002a).

The well-established fish and benthic communities provide a substantial food source for birds that now frequent the area. Historically, the low quality habitat provided little niche space that resulted in low overall species richness. Use of the wetlands has increased over time and the bird community has become an integral part of the complex wetland food web. Both migratory and resident bird species that fill various trophic levels have been observed including piscivores (e.g., great egrets, osprey), invertivores (e.g., American robin, swallows), and granivores (e.g., red-winged blackbirds, sparrows). Many of these birds rely on the wetlands for foraging, nesting, breeding, and shelter.

South Wetlands

Similar to the North Wetlands, the South Wetlands now consists of equal proportions of high and low marsh habitat. The marsh and pond are twice daily inundated by high tides and contain several permanent pools. Palustrine Emergent Marsh (PEM) is the dominant cover type and includes mudflats that are exposed at low tide, and aquatic beds that support rooted and submerged aquatic vegetation. Vegetation within the South Wetlands has become more diverse structurally with added strata, cover types, and greater vegetation/water interspersion. The plant community species richness for the South Wetlands is composed of 71 taxa (5 planted species and 66 naturally recruited species). This species richness greatly surpasses that observed in the reference area (Nonesuch Creek) in which only 26 species were noted (DuPont CRG, 2003b). Successful establishment of diverse wetlands vegetation cover has provided the basis for increasing functional capacity for providing sediment stabilization, water quality and wildlife functions (DuPont CRG 2002c). The *Phragmites* control program has been successful in minimizing its presence.

Successful restoration of the South Wetland has vastly improved the functional capacity of this wetland to support fish communities in the Christina River. The drainage features continue to promote tidal flushing of the South Wetlands and water exchange within the South Pond. Fisheries surveys conducted annually in 2000, 2002, and 2003 have indicated that the South Wetland supports a healthy diverse fish community comprised primarily of

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freshwater species with occasional use by estuarine species. The removal of dense stands of *Phragmites*, coupled with the restoration of drainage systems in the wetland have successfully created a tidally contiguous, open water habitat that regularly inundates the surrounding vegetation. The increased diversity of aquatic habitat types currently accessible to fish communities has provided niches for numerous species from all life stages (mature, mature spawning, juvenile, young-of-the-year, and larval fish). The presence of these various life stages indicates that the functional capacity of the South Wetland now includes spawning, feeding, and rearing grounds for fish communities. In addition, this wetland has continued to develop, attracting and supporting new species including obligate wetland fish such as the eastern mudminnow (*Umbra pygmaea*), collected in 2003. Overall, the abundance and structure of this fish community clearly demonstrates that the South Wetlands have been successfully restored to a level where the aquatic habitat now functions as an integral part of fisheries development, diversity, and recruitment within the Christina River Watershed (DuPont CRG 2002c).

The dramatic change in vegetative cover types has resulted in habitat opportunities for a variety of migratory and resident bird species. In addition, the well-established fish and benthic communities provide a substantial food source for birds that now frequent the area. Where the original monotypic stand of *Phragmites* provided poor bird habitat, the current habitat provides space for all trophic levels of birds. Many of these birds rely on the wetlands for foraging, nesting, breeding, and shelter.

2.2 SUMMARY OF RESPONSE ACTIONS

In 1988, DuPont entered into an Administrative Consent Order (ACO) with the EPA to complete investigations for the Newport Site in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Superfund Amendments and Reauthorization Act (SARA). The site was included on the National Priorities List (NPL) in early 1990. A RI/FS was conducted in three phases between August 1988 and August 1992. In August 1993, a ROD that specified the remedial actions for seven operable units was issued. A summary of these units and the Selected Remedy is listed in Table 2-1.

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Table 2-1 - Summary of ROD Requirements for DuPont Newport Site

Unit	Selected Remedy	Purpose
Ballpark	Excavation of soil above 500 mg/kg total lead; disposal in North Landfill	Prevent exposure to elevated levels of lead
North Landfill and Wetlands	Capping; wetlands remediation, restoration and monitoring; waste pile stabilization and consolidation in the North Landfill; vertical barrier wall installation to the base of the Columbia aquifer; groundwater recovery and treatment	Prevent continued contaminant releases to the groundwater that discharges to the river and the North Wetlands; cleanup areas of unacceptable environmental impact in the North Wetlands; prevent exposure of plant and terrestrial life to contaminated soil
South Landfill	Excavation and consolidation of contaminated soil underneath and to the east of Basin Road or South James Street onto the South Landfill	Prevent continued contaminant releases to the groundwater that discharges to the Christina River and the South Wetlands; prevent unacceptable human exposure to the contaminated soil from the South Landfill
South Wetlands	Excavation; sediment disposal in the South Landfill; restoration; monitoring	Prevent unacceptable impact to environmental receptors
Christina River	Dredging; sediment dewatering and disposal in North or South Landfill; monitoring	Prevent unacceptable impact to environmental receptors
Ciba-Geigy and DuPont Holly Run Plants	Vertical barrier wall installation along the Christina River at the Ciba-Geigy Plant; paving the unpaved ground within the contaminated Plant Areas; recovery and treatment of the groundwater upgradient of the barrier wall; instituting special Health and Safety Plans (HASPs) for intrusive work	Prevent continued releases of contaminants to the groundwater that discharges to the Christina River; prevent unacceptable human exposure to contaminated soil
Groundwater	Monitoring; providing public water supply along Old Airport Road; establishing a groundwater management zone; invoking the ARARs Wavier	Prevent potential future human exposure to the site-related contaminated groundwater; prevent further contamination of the Columbia and Potomac aquifers; protect the South Wetlands

In 1994, DuPont submitted a Remedial Design/Remedial Action Work Plan, as directed by the ROD and ACO. Incorporated in this work plan was an initial value-engineering assessment that identified the most cost-effective implementation of remedies specified in the ROD that are also protective of human health and the environment. Pre-design investigations were outlined for the North and South Wetlands and the Christina River to delineate areas for

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sediment removal. A phased sampling strategy was developed and implemented to fulfill the ROD requirements. The ROD required delineation of three metals (cadmium, lead, and zinc) that were associated with the pigment manufacturing at Newport. Two sets of criteria were provided in the ROD: EPA site-specific sediment cleanup criteria (SSCC) and apparent effects threshold (AET) values. Sediment concentrations exceeding the SSCC in the sediments would need to be excavated, while sediment concentrations below the AET values could be left in place. Those concentrations detected between these two criteria may have required additional investigation.

Delineation investigation, remedial action and restoration of the wetlands and river areas were completed sequentially. The pre-design investigations for the wetlands were completed before the river. Remedial action and restoration was completed for the North Wetlands, followed by the South Wetlands, and then the Christina River. The actions are summarized below.

North and South Wetlands

Delineation investigations for the North and South Wetlands were completed between December 1994 and December 1995. Based on this data, the delineated excavation footprints were approved by EPA by February 1996. Excavation and restoration were completed in accordance with the approved 100 percent Design Plans for each of the wetlands (DuPont Environmental Remediation Services, 1997a and b).

As part of the restoration design, DuPont proactively evaluated and incorporated additional restoration options beyond those required in the ROD. As part of this process, DuPont met with representatives of the EPA, DNREC, NOAA and USFWS to define additional potential restoration options that would be considered valuable to the stakeholders. The identified restoration options were then evaluated using the Evaluation of Planned Wetlands (EPW) (Bartoldus, et. al, 1994) to develop a restoration plan that best balanced the different functions that the wetlands could potentially perform. The EPW was recommended by the USFWS for the Newport wetlands restoration as a tool to demonstrate overall habitat improvements compared to the pre-remediation condition (DuPont Environmental Remediation Services, 1997a and b, and DuPont CRG, 1998).

Implementation of the ROD requirements would have returned the wetland areas to their original baseline conditions. However, the additional restoration enhancements implemented above the ROD requirements, and developed with input of the stakeholders have resulted in the creation of a significantly improved habitat with markedly increased functional

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capabilities for several wetland functions. This increase in function was used by the Trustees to offset the injuries and service losses (the NRD) that were estimated for the Newport Site.

Restoration Options – North Wetlands

Remediation activities in the North Wetlands began in 1997 and restoration was completed in 1998. The EPA signed the Remedial Action Completion Report in June 1998. Maintenance and monitoring of the restoration began in June 1998 in accordance with the approved Maintenance and Monitoring Plan (DuPont CRG, 1998). The North Wetlands has passed its sixth year post restoration (1998 to 2003). Success metrics for vegetative cover, sediment stabilization, and invasive species were met within 3 years post-restoration. The site exceeds regional reference locations in terms of vegetative diversity and use by wildlife. Extensive data and information on the wetlands restoration progress has been collected from 1998 to the present as part of the annual and routine monthly inspections outlined in the Maintenance and Monitoring Plan (DuPont CRG, 1998) and Addendum (DuPont CRG 2002a).

As presented in DuPont Environmental Remediation Services 1997a, the North Wetlands remediation and restoration consisted of the following basic components that were not part of the ROD requirements:

- Stabilization of the river berm
- Shoreline erosion protection
- Sediment excavation to a greater depth and backfilling
- Construction of a water control structure
- Sediment stabilization with erosion matting
- *Phragmites* control program

Stabilizing the river berm and providing shoreline bank erosion protection improved the drainageway habitat, stabilized sediment, increased the amount of open water at high tide, improved water quality, and provided better forage and cover for fish and wildlife. More importantly, river berm stabilization will ensure long-term wetlands protection, and prevent the loss of the berm and the wetlands.

For excavation, the ROD required removing 1-foot of sediment from the wetlands. DuPont removed all sediment down to the marsh clay deposit layer (approximately 2 to 3 feet) to eliminate any potential future concerns of recontamination from sediments left in place. Removal of the additional material, in conjunction with the water control structure, allowed for a permanent pool of water to be a part of the final design. In addition, the design allowed

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the wetland to be inundated daily during high tide. Thus, this design creates a clean, permanent open water habitat that was not previously present.

The *Phragmites* eradication program consisted of spraying and burning, and physical destruction of the root mass. Increased saline circulation in the marsh is expected to exclude future invasion by *Phragmites*. Control of *Phragmites* and other invasive species helped promote colonization of the marsh habitat by a more diverse assemblage of native plants. A diverse plant assemblage provides for better animal forage and enhances the functional capacity of the restored marsh to support wildlife.

Restoration Options – South Wetlands

Remediation activities and restoration were completed in 1998 for the South Wetlands. The EPA signed the Remedial Action Completion Report in January 1999. Maintenance and monitoring of the restoration began in January 1999 in accordance with the approved Maintenance and Monitoring Plan (DuPont CRG, 1999). The South Wetlands has past its fifth year post-restoration (1999 to 2003). Success metrics for vegetative cover, sediment stabilization, and invasive species were met within the first three years post restoration. As with the North Wetlands, the South Wetlands exceeds regional reference locations in terms of vegetative diversity and use by wildlife. Extensive data and information on the wetlands restoration progress has been collected as part of the annual and routine inspections as outlined in the Maintenance and Monitoring Plan (DuPont CRG, 1999) and Addendum (DuPont CRG, 2002a).

The South Wetlands remediation and restoration were similar to that of the North Wetlands in that DuPont proactively included the following basic components that were above and beyond the ROD requirements in an attempt to optimize functions and values that could be provided by the restoration site (DuPont Environmental Remediation Services, 1997b):

- Sediment excavation to a greater depth and backfilling
- Hummock construction and planting
- Sediment stabilization with erosion matting
- Removal of berm
- South Pond enhancement
- *Phragmites* control program

As with the North Wetlands, DuPont exceeded the 1-foot sediment removal depth required by the ROD and removed all sediment down to the marsh clay deposit layer (approximately 2