NOTICE OF INTENT TO REISSUE A CORRECTIVE ACTION PERMIT TO DUPONT CHATTANOOGA PLANT AND TO APPROVE CORRECTIVE ACTION REMEDIES

The Tennessee Department of Environment and Conservation's (TDEC) Division of Solid Waste Management (DSWM) proposes to reissue a corrective action permit to E.I. DuPont de Nemours & Co. Inc.'s Chattanooga Plant (DuPont) that would allow the facility to implement final corrective action remedies. This action follows the pre-application public meeting conducted by the facility on June 22, 2006 as required by Tennessee Rule 1200-1-11-.07(2)(c)3(i). No members of the community attended the public meeting.

DuPont, EPA ID Number: TND 00 333 1766, located at 4501 North Access Road, Chattanooga, Tennessee 37415, is currently permitted under Tennessee Permit Number TNHW-095. The previous Hazardous Waste Storage Permit was issued on September 30, 1996. The current permit was effective for ten years. As of September 25, 2006, the storage portion of the Hazardous Waste Container Storage Permit was terminated upon closure of the unit. However, the requirements for corrective action remained in effect. DuPont submitted a Part A and Part B Application to DSWM for renewal of the facility's corrective action permit on June 30, 2006, thus enabling the facility to continue to perform corrective action under the current permit until a final decision is made. The proposed permit is for the implementation of final remedies for all the Solid Waste Management Units (SWMUs) and Areas of Concern (AOC's) that require corrective measures. A Fact Sheet has been prepared that summarizes the draft permit requirements.

The Fact Sheet includes a Statement of Basis (SB) that recommends remedies for those releases identified during the corrective action process and is designed to facilitate public participation in the remedy selection process. The SB summarizes the nature and extent of the contamination, the potential risks to human health and the environment, and the remedy to be implemented. The permit proposes a final remedy that requires DuPont to maintain institutional controls to limit the possibility of exposure to contaminants. Additionally, the permit requires DuPont to perform site-wide groundwater monitoring. The groundwater cleanup standard was established to be protective of the surface water body into which the groundwater discharges, the Tennessee River (Nickajack Lake). In addition to corrective action, under the conditions of this permit, DuPont will also be required to notify of imminent hazards; and as applicable, comply with the requirements developed under land disposal restrictions and organic air emission standards. If issued, the permit will be valid for 10 years.

The permit is proposed to be reissued under the authority of the Tennessee Hazardous Waste Management Act of 1977, as amended, Tennessee Code Annotated, Section 68-212-101 et seq., and Rule Chapter 1200-1-11, Hazardous Waste Management.

Copies of DuPont's application, draft permit, fact sheet, statement of basis, and public notice are available for public inspection at the Hamilton County Bicentennial Library, 1001 Broad Street, Chattanooga, Tennessee 37402 (telephone 423-757-5310). These materials are also available for public inspection during normal business hours, 8:00 a.m. to 4:30 p.m., Monday through Friday, except legal holidays, at the TDEC Chattanooga Environmental Field Office, Public Access Area, Chattanooga State Office Building, Suite 550, 540 McCallie Avenue, Chattanooga, Tennessee 37402 (telephone 423-634-5745) or at DSWM's Central Office, 5th Floor, L & C Tower, 401 Church Street, Nashville, Tennessee 37243-1535 (615-532-0780).

Any interested person may submit written comments on DSWM's proposal or request a public hearing by contacting: Mr. Clayton Bullington; Corrective Action Section; Division of Solid Waste Management; TDEC; 5th Floor, L & C Tower; 401 Church Street; Nashville, TN 37243-1535; telephone 615-532-0859; or e-mail to Clayton.Bullington@state.tn.us. The comments or request for a public hearing must be received by 4:30 p.m., Friday, June 13, 2008, to assure consideration. After considering all public comments received, the DSWM Director will issue a final permit decision and a Response to Comments.

TDEC is committed to principles of equal opportunity, equal access, and affirmative action. Contact the EEO/AA Coordinator at 1-888-867-7455 or the ADA Coordinator at 1-866-253-5827 for further information. Hearing impaired callers may use the Tennessee Relay Service (1-800-848-0298).

Persons who wish to be on DSWM's mailing list should request a Mailing List Request form by calling or writing: Public Participation Officer; Division of Solid Waste Management; TDEC; 5th Floor, L & C Tower; 401 Church Street; Nashville, TN 37243-1535 (615-532-0798); or e-mail Solid.Waste@state.tn.us.

NOTICE ISSUED: April 29, 2008

FACT SHEET

INTENT TO REISSUE A CORRECTIVE ACTION PERMIT

Facility Name: DuPont Chattanooga Plant

Location: 4501 North Access Road, Chattanooga, Tennessee 37415

EPA ID Number: TND 00 333 1766

Permittee: E.I. DuPont de Nemours & Co. Inc.

Owner/Operator: E.I. DuPont de Nemours & Co. Inc.

Regulated Units: The purpose of this Corrective Action Hazardous Waste Management Permit is only to address remedial action at facility solid waste management units and areas of concern that do not require an operating permit

Facility Contact: T. Keith Lewis
DuPont Chattanooga Plant
4501 North Access Road
Chattanooga, Tennessee 37415
(423) 875-7351 - office phone

Comment Period: Begins: **April 29, 2008**
Ends: **June 13, 2008**

FACILITY DESCRIPTION

E.I. DuPont de Nemours & Co. Inc. (DuPont) began construction on the Chattanooga, Tennessee plant in 1945 and initiated operations in 1948. The facility manufactured nylon resins and fibers, liquid crystal polymer, and polyester yarns and resins. Currently, the plant continues to manufacture synthetic resins and fibers. DuPont transferred assets of its corporate subsidiary, Invista, Inc. to a private company owned by Koch Industries Inc. on April 30, 2004. The new company, named Invista, S.a.r.l. was only leased the property for their operations at the Chattanooga plant. DuPont retained ownership of all the land and continued some operations at the site. Since they continued to be a large quantity generator at the site, DuPont kept their hazardous waste management storage permit. That permit includes the requirements for the facility to identify solid waste management units and to perform corrective action of past releases to the environment. Throughout the operational history of the DuPont Chattanooga Plant, waste materials have been stored, treated or disposed of on-site. Treatment or disposal units on the site have included landfills, surface impoundments, waste-water treatment and pretreatment units, waste and storm water sewers, liquid disposal pits, aboveground storage tanks, and an incinerator. These past practices at the site have contaminated soil and groundwater, which now require the implementation of long-term corrective measures. Currently, there are no hazardous waste activities that require a permit, except for ongoing corrective action for the Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) at the facility.

PURPOSE

This fact sheet is prepared pursuant to Tennessee Rule 1200-1-11-.07(7)(d) for the draft permit developed by the Tennessee Department of Environment and Conservation's (TDEC) Division of Solid Waste Management (DSWM). The purpose of this permitting process is to afford any interested persons the opportunity to evaluate the ability of the permittee to apply the applicable hazardous waste management (corrective action) requirements. The proposal is for the renewal permit to be reissued under the authority of the Tennessee Hazardous Waste Management Act of 1977, as amended, Tennessee Code Annotated, Section 68-212-101 et seq., and Rule Chapter 1200-1-11, Hazardous Waste Management. The permit is prepared in accordance with the provisions of Rule 1200-1-11-.07.

PERMIT HISTORY AND PROPOSED PERMIT

The current hazardous waste permit, TNHW-095, was issued to DuPont on September 30, 1996. The permit was effective for ten years. The permit allowed the facility to store hazardous wastes on the RCRA drum storage pad in either 30 or 55-gallon DOT-approved drum containers with a maximum allowed pad storage capacity of 11,000 gallons. DuPont notified TDEC that it was closing their hazardous waste management unit on May 24, 2006. TDEC approved the clean closure of the hazardous waste storage pad on September 25, 2006. Because of the need for continued corrective action at facility SWMUs and AOCs, the corrective action portion of the permit remained in effect.

Tennessee Hazardous Waste Management Regulations require that the facility submit the renewal application 180 days before the current permit expires. The permit application was due on April 3, 2006; however, TDEC approved a request for an extension until June 30, 2006. DuPont submitted the Part A and Part B Hazardous Waste Permit Renewal Application for the continuation of corrective action on June 30th, thus enabling the facility to continue to perform corrective action under the current permit and TN Rule 1200-1-11-.06(6)(l) until a final decision is made. DuPont held a Pre-Application Public Meeting on June 22, 2006, which had been public noticed in the Chattanooga Times Free Press on May 16, 2006. No members of the public attended this meeting.

By public noticing the issuance of the draft permit for public review and comment, the Commissioner is advising that a tentative decision has been made to approve DuPont's permit request. If issued, the hazardous waste corrective action permit will be effective for ten years.

EPA and TDEC performed a RCRA Facility Assessment (RFA) at the DuPont Chattanooga Plant in 1994. The RFA identified thirty-four SWMUs and three AOCs. On September 30, 1997, EPA issued a Hazardous and Solid Waste Amendments (HSWA) permit that required DuPont to perform corrective action for any releases from the existing units and any other newly discovered units. Simultaneously, TDEC modified their storage permit to include the same corrective action requirements as specified in the Tennessee Hazardous Waste Management Regulations.

Under the permits, ten SWMUs were listed as No Further Action (NFA); i.e., those units did not require an investigation or cleanup under the corrective action conditions of the permits. Confirmatory Sampling (CS) or a RCRA Facility Investigation (RFI) was required for all the

other units. One additional SWMU and three more AOCs were discovered during the investigations. This included AOC-GW, Site Groundwater, which addresses groundwater contamination as one large block (site-wide), as opposed to linking to individual units for monitoring and/or remedial actions.

Attached to this Fact Sheet is a Statement of Basis that explains the basis and recommendations for final remedy selection of all the units not identified as NFA in the 1997 permit modification. Table 1 summarizes the proposed final disposition of all the SWMUs and AOCs at the DuPont Chattanooga Plant. None of the units require active remedial action; however, many areas are restricted to industrial usage or require institutional controls to limit the risk from exposure to hazardous constituents. AOC-GW will require long term groundwater compliance monitoring. Also, surface water monitoring will be required to ensure that screening levels are not exceeded in a drainage ditch and a spring where contamination was previously noted. Both locations are in the northern part of the DuPont Chattanooga Plant Property.

COMMENTS

Copies of DuPont's application, draft permit, fact sheet, statement of basis, and public notice are available for public inspection at the Hamilton County Bicentennial Library, 1001 Broad Street, Chattanooga, Tennessee 37402 (telephone 423-757-5310). These materials are also available for public inspection during normal business hours, 8:00 a.m. to 4:30 p.m., Monday through Friday, except legal holidays, at the TDEC Chattanooga Environmental Field Office, Public Access Area, Chattanooga State Office Building, Suite 550, 540 McCallie Avenue, Chattanooga, Tennessee 37402 (telephone 423-634-5745) or at DSWM's Central Office, 5th Floor, L & C Tower, 401 Church Street, Nashville, Tennessee 37243-1535 (615-532-0780). A copy of the public notice, the fact sheet and the statement of basis with color maps and photos is available on-line at www.state.tn.us/environment/swm/ppo.

All persons, including the applicant, who believe that the tentative decision to reissue this permit is inappropriate must raise all ascertainable issues and submit all available arguments and factual grounds supporting their position by sending comments or requesting a public hearing to: Mr. Clayton Bullington; Division of Solid Waste Management; Tennessee Department of Environment and Conservation; 5th Floor, L & C Tower; 401 Church Street; Nashville, Tennessee 37243-1535; telephone 615-532-0859 or e-mail to Clayton.Bullington@state.tn.us. Requests for a public hearing must state the nature of the issues proposed to be raised at the hearing. To assure consideration, comments or requests for a public hearing must be received by **4:30 p.m., Friday, June 13, 2008.**

When DSWM makes a final permit decision to either reissue or deny the permit, notice will be given to the applicant and each person who has submitted written comments or requested notice of the final decision. The final permit decision shall become effective upon signing by the Director of DSWM.

Persons who wish to be on DSWM's mailing list should request a Mailing List Request form by calling or writing: Public Participation Officer; Division of Solid Waste Management; Tennessee Department of Environment and Conservation; 5th Floor, L & C Tower; 401 Church Street; Nashville, Tennessee 37243-1535; telephone 615-532-0798; or e-mail Solid.Waste@state.tn.us.

STATEMENT OF BASIS

DUPONT CHATTANOOGA PLANT

This Statement of Basis (SB) contains a summary of the locations, the operating histories, the contaminants detected, and the remedies selected for the Solid Waste Management Units and Areas of Concern at DuPont's Chattanooga Plant. This SB is an attachment to the Fact Sheet that is being noticed for public review and comment as part of Tennessee's corrective action permitting process. The Fact Sheet provides the details for public review and comment on the SB and the draft permit.

SITE SETTING AND LOCATION

The DuPont Chattanooga Plant sits on a 460-acre tract at 4501 North Access Road, Hamilton County, Chattanooga, Tennessee (Figure 1). The facility, owned by E.I. DuPont de Nemours & Co. Inc., is located in the southern portion of the Great Valley of Tennessee, an area of the Tennessee River between the Cumberland Mountains to the west and the Appalachian Mountains to the east. Local topography is complex, with a number of minor valleys and ridges. The DuPont property is bounded by the Tennessee River to the south and southeast, DuPont Parkway on the west and northwest, and State Highway 153 on the north. The geographic location of the facility is N 35^0 06' 44" latitude and W 85^0 14' 33" longitude.

GEOLOGICAL SETTING AND HYDROGEOLOGY

The DuPont Chattanooga Plant (the site) is situated in the western part of the Valley and Ridge physiographic province and in the eastern part of the Cumberland Plateau. Structurally, the site lies across a broad, regionally extensive, faulted anticlinorium between White Oak Mountain synclinorium on the east and the Walden Ridge syncline on the west. The local geologic sequence consists of surficial clays to a depth of approximately 25 to 30 feet. These clays thin to the west and north, away from the sediments deposited by the Tennessee River. Underlying the surficial clays are shales, limestones, and dolomites. The site lies between the Cranmore Cove and the Missionary Ridge thrust faults. Fracturing associated with the folding and faulting creates paths for groundwater migration in the limestone bedrock. The upper aquifer is located in the karstic carbonate rocks and in the overlying clay-rich regolith. The low permeability of the residual soils acts as a leaky confining layer for the underlying bedrock aquifer. Diffuse groundwater flow dominates the thick regolith, with primary flow traveling along secondary, higher-permeability features.

CHRONOLOGICAL SUMMARY OF SITE EVALUATION AND REMEDY SELECTION

Since 1993, DuPont has completed a RCRA Facility Assessment that identified the solid waste management units (SWMUs) and Areas of Concern (AOCs) at the site; performed a complete environmental investigation of the site; submitted a corrective measures study report (CMS) with recommendations on selected remedies for all the SWMUs and AOCs; and implemented site-wide institutional controls and long-term monitoring for the protection of human health and the environment. The January 18, 2005 report *Corrective Measures Study for DuPont Chattanooga Plant* provides a detailed summary of the entire corrective action process performed at the site.

CONFIRMATORY SAMPLING (CS): The CS investigation implemented at the DuPont Chattanooga Plant included all of the SWMUs and AOCs that were not listed as No Further Action in the corrective action permit tables. The CS Work Plan was approved by both USEPA and TDEC in late 1998 and was executed in March through June 1999. In addition to the typical release confirmation sampling, the scope of the CS also included unit characterization sampling, physical evaluation of type and thickness of cover material, characterization of potential migration routes, and characterization of most likely exposure routes. The additional data collected on all RCRA Facility Investigation (RFI) and CS units allowed for the SWMUs and AOCs to be prioritized based on risk to human health or the environment. All the unit locations are depicted on Figure 2. The final disposition of each unit is depicted on Figure 3

The result of the prioritized ranking process was to focus future investigations on those units that posed the greatest potential threat to human health and the environment. The general approach applied to sampling for the CS Investigation was based on a progressive targeting of locations that were most likely to confirm a release. The value of the data from each sample was thereby maximized, reducing the need for additional release confirmation sampling. Specific sampling approaches were developed for the main types of units, i.e., land disposal units for solid material, settling ponds, surface units, and other types of units. Although aspects of the sampling approach, such as sampling depth and number of samples, varied for each unit, the overall approach for each type of unit was similar.

Based on the data collected, the overall conclusion of the CS Investigation was that the SWMUs and AOCs at the DuPont Chattanooga Plant did not constitute a significant threat to human health and the environment. Throughout the site, only low levels of releases of hazardous constituents to the environment were noted, as was the minimal potential for new releases from the units. Most of the releases were determined to be too low to present a significant risk for exposure, or that any potential for exposure could be prevented or controlled.

There were eight units that were considered high priority for further investigation. Additional investigative measures to further evaluate the potential for exposure were recommended for the next phase of work (Phase I RFI). Additionally, a voluntary remediation and institutional controls to prevent or control exposures were recommended for SWMU 33, Spent Nitric Acid Tank. There were nine units that were considered to have insufficient data to allow them to be ranked as either high or low priority. Additional investigative measures were recommended to either confirm releases or determine the exposure potential at these units. The remaining ten units were ranked as low priority for further investigation. The likelihood of adverse impacts to human health and the environment from these units was considered minimal. Lastly, the CS Report recommended that a site-wide groundwater investigation program be implemented as part of the RFI. The site-wide program was expected to focus on understanding migration pathways, potential receptors and specific exposure scenarios to gather sufficient information to determine whether human exposures were under control.

RCRA FACILITY INVESTIGATION (RFI): The Phase I RFI Work Plan was approved in March 2000 and implemented in May through September 2000. The goal of the Phase I RFI was to further characterize the release or potential for release from specific SWMUs and AOCs and to assess the potential for adverse effects to human health and the environment as a result of releases from those units or areas. The Phase I RFI was mainly focused on acquiring additional

data related to quantifying potential on-site exposures and gaining a better understanding of the complex hydrogeology of the site. Additional samples were collected to help characterize potential migration pathways and to determine the dimensions of a new unit that was discovered during the CS investigation.

The exposure characterization focused on quantifying the potential for exposure where site workers could, under certain circumstances, come in contact with constituents that exceed conservative exposure scenarios, i.e., those used in the development of USEPA, Region 9 Preliminary Remediation Goals (PRGs). The technical approach applied to satisfying this objective was to collect additional exposure media data, where needed, and evaluate the potential exposure by defining realistic exposure scenarios for on-site workers.

The field portion of the RFI Investigation focused mainly on filling data gaps regarding release potential and exposure potential. The media sampled included surface soil, subsurface soil, sediment, surface water, and groundwater. The Phase I RFI also included geophysical studies of SWMUs, test pit inspection for buried drums, and a site-wide hydrogeological study.

On March 8, 2001, in a meeting with TDEC, DuPont presented and discussed the results, conclusions, and recommendations from the Phase I RFI. The overall conclusion of the Phase I RFI was that the unit contents and routes of exposure were adequately characterized for all but six of the units evaluated in the RFI. Most of the analytical results for those six SWMUs, though, were below the PRGs for industrial soil. In instances where PRGs were exceeded, the data was evaluated in the context of the exposure assessment for each particular unit. At these units, complete exposure pathways were not present or the exposure was determined not to be significant, i.e. the frequency of exposure was expected to be low.

Six units remained a high priority for further investigation because the potential for release to groundwater remained undetermined, or because additional potential exposure data gaps were identified. The first two phases of the site-wide groundwater investigation significantly advanced the understanding of the karst flow system. The fracture trace analysis provided general locations of major flow conduits that were confirmed with great accuracy by resistivity surveys. Seven new monitoring wells screened major flow conduits near the downgradient perimeter of site operations. Monitoring results from the new wells indicated that source areas such as the eastern portion of the active plant area (near AOCs D and E and SWMU 23 and near SWMUs 24, 29, and 30) had impacted groundwater. Groundwater from these areas was monitored by the new wells along flow conduits leading to the Tennessee River. Groundwater monitoring results also indicated that the western portion of the site showed very little impact to groundwater.

The Phase I RFI Work Plan Addendum (Addendum) was developed in an effort to streamline the RFI processes by reducing report and work plan submittals and approvals. DuPont met with TDEC on March 8, 2001 to review the status of the Phase I RFI and discuss data gaps, and to then make recommendations for additional investigatory work. Fieldwork for the Addendum began in June and continued through October 2001. The goals of the Addendum were to determine the potential for release from three SWMUs and to assess the potential for adverse impacts to human health and the environment at three other units. An additional goal was to advance the understanding of the groundwater flow system, flow direction, and contaminant migration routes.

The Phase I RFI Work Plan Addendum included plans for soil borings at three units and surface soil, sediment, and surface water samplings at three other units. The soil borings were completed at SWMUs 13, 27, and 29b to determine whether these units had released constituents to groundwater. Surface soil samples were collected from SWMU 30 for PCB analysis. Paired sediment/surface water samples for PCB analysis were collected from the drainage ditch adjacent to SWMUs 17 and 18. The surface soil, sediment and surface water samples were collected to determine whether PCBs were present and to evaluate potential PCB exposures. Hydrogeological investigation activities included surface resistivity surveys to identify optimal locations for the installation of six additional monitoring wells; borehole geophysics; and two full rounds of groundwater sampling and analysis.

Results of the soil boring investigation did not indicate that releases to groundwater have occurred at either SWMU 13 or 27. The release of volatile organic compounds (VOCs) to groundwater at SWMU 29B has been confirmed, but no PCBs were found to have been released to groundwater from the unit. Results of the surface soil sampling at SWMU 30 and sediment/surface water sampling at the drainage ditch adjacent to SWMUs 17 and 18 indicated that although PCBs were detected, an evaluation of unit-specific exposure assumptions indicated that an unacceptable exposure does not exist at these units. Additional PCB specific sampling was recommended for SWMU 23, the origin of the drainage ditch, and from the outfall from the wastewater treatment plant at the southern boundary of the site. A habitat screening assessment was recommended to provide a context for evaluation of the PCB data. Results of the hydrogeological investigation activities indicated that the major groundwater migration pathways were being monitored and that a tracer study was not necessary. Results of the investigation also indicated that site contaminants of potential concern (COPCs) have been detected in wells at the downgradient margin of the site and that additional monitoring was recommended to evaluate stability of the plume and estimate the potential impacts to the Tennessee River.

On October 4, 2001, DuPont met with TDEC to conduct a Facility Action Plan (FAP) Workshop. The purpose of the meeting was to present and discuss the results of the corrective action (CA) activities conducted as of that date, and to develop goals, a scope, and a schedule for CA activities for the following calendar year. The overall goal of the FAP was to streamline the process by incorporating a more interactive and dynamic approach that eliminated some work plan and report requirements. The FAP was submitted on December 10, 2001. The scope of the FAP included addressing PCB-related data gaps, evaluating groundwater plume stability, and evaluating continued validity of exposure assessments for units where concentrations were in excess of Region 9 PRGs.

An investigation for the potential presence of PCBs was not conducted in either the CS or Phase I RFI, because PCBs were not suspected to be present at the site. However, the findings of an environmental site assessment in 2000 revealed that PCBs had been used in manufacturing operations at the site. Subsequently, an investigation for PCBs was included in the CA program. PCBs were utilized at the DuPont Chattanooga Plant until the early 1980s in heat-transfer oils used in the production of nylon yarn. During maintenance activities, small quantities of PCB containing waste oils drained to the same sumps as waste finish (vegetable-based) oils. Waste finish oils were then managed at SWMUs 23, 29 and 30. PCBs have also been identified in ditch-bottom soils and in the sediment from surface drainage ditches on the site. Previous investigations included sampling of surface soil, surface water, and sediment for the presence of

PCBs. Initially, PCBs detected on site were quantified as arochlors (specific commercial formulations). When exposed to the environment PCBs weather. Consequently, it was questionable whether quantification as arochlors provided an accurate reference point for evaluation. Therefore, sampling was conducted in 2002 to quantify PCB congeners in ecologically relevant areas and in particular, in those areas that drain off site.

The 2002 sampling event revealed evidence of PCBs in both the East and South Drainage Ditches. The potential exists for migration of PCBs off site via these pathways. East Drainage Ditch flows year round into North Chickamauga Creek and ultimately into the Tennessee River. South Drainage Ditch flows to the Tennessee River. Due to the presence of PCBs detected in sediments and surface water in the most downstream on-site samples collected in the East and South Drainage Ditches, further investigation was recommended in the RFI Report to evaluate the potential downstream impact. As a result, in 2003, additional surface water and sediment sampling was conducted at locations downgradient of previous sampling points in both ditches.

Concentrations and distribution of PCBs in soil, surface water and sediment are consistent with management of waste finish oils at the site. The highest concentrations of total PCBs have been detected at suspected source areas, SWMUs 23, 29a and 30, where waste finish oils were historically managed. Runoff from these units is responsible for PCBs being detected in both on and off-site drainage pathways, which include the dry ditches near SWMU 30, the ponded ditch adjacent to SWMU 17, East Drainage Ditch and South Drainage Ditch. An evaluation of potential exposures within source and drainage areas indicates no unacceptable risks to possible human receptors including workers and trespassers. In addition, suspected source and drainage areas are not significant or unique ecological habitat. The levels of PCBs detected in environmental media in these areas do not present unacceptable risk to potential ecological receptors. Based on the findings presented in the *PCB Investigation Report*, no further investigation was recommended.

CORRECTIVE MEASURES STUDY (CMS): The methodology utilized for completion of the CMS at the DuPont Chattanooga Plant differed significantly from that of a traditional CMS. The Corrective Action approach developed by TDEC and DuPont was oriented toward managing potential exposures and demonstrating that the groundwater contamination had stabilized. The outcome was a risk-based categorization for each SWMU and AOC that is based on the unit's character and setting. The proposed CMS approach by DuPont was discussed and modified in a meeting with TDEC on June 24, 2004. Traditional CMS approaches focus on evaluating remediation technologies for effectiveness, feasibility, cost, and compliance with Applicable or Relevant and Appropriate Requirements (ARARs). At the Chattanooga Plant, DuPont adopted a Unit Classification Approach for the CMS. In the Unit Classification Approach to the CMS, the following factors were considered for each unit:

- Comparison to conservatively derived residential and industrial screening criteria
- Evaluation of potential for exposure at each unit
- Need for exposure control though institutional/administrative controls
- Need for remedial action

DuPont's Unit Classification Approach to the CMS first considered whether or not the positively biased data collected for the unit exceeded either residential or industrial risk-based screening

levels. It should be noted that the screening levels used are conservatively derived and are not representative of typical exposures at the site. Further, while it is not the intent to convert this site to residential use, comparisons to residential screening levels are employed to identify those areas that could be classified for unrestricted use. If all of the data collected is below residential screening criteria, then the unit is categorized as "Meets Residential Exposure Criteria" and would therefore, be suitable for unrestricted use, and would not require further action. A unit where data comparison indicates that residential screening levels have been exceeded, but have not exceeded industrial screening, would be classified as "Meets Industrial Exposure Criteria" and would be restricted to industrial usage. Where data comparison indicates that industrial screening criteria have been exceeded, the unit would be further evaluated for exposure control through the use of institutional/administrative measures. If the potential for exposure cannot be managed through institutional controls, then remedial action would be warranted, and a traditional CMS approach would be applied to that unit. Where media concentration levels are likely to vary, such as in groundwater, a unit would require continued monitoring as an institutional control to ensure that any potential exposures remain acceptable for that unit and setting.

RECOMMENDATIONS FOR FINAL REMEDY: DuPont's CMS recommended final remedies for all the SWMUs and AOCs that required a CS investigation, an RFI, or those units newly identified during those investigations. Table 1 lists the final corrective action disposition for all those units, including the units previously determined as No Further Action during the RCRA Facility Assessment. For the units that underwent additional investigation, DuPont categorized the selected final remedies as follows:

- Unrestricted Use -- Unrestricted Use was recommended where units with detected concentrations did not exceed conservative residential screening criteria.
- Restricted to Industrial Use -- Restricted to Industrial Use was recommended where units with detected concentrations did not exceed conservative industrial screening criteria.
- Institutional Controls Required -- Institutional controls were recommended where units with detected concentrations exceeded conservative industrial screening criteria and exposure potential could be effectively managed.
- Continued Monitoring -- Continued monitoring was recommended as the final remedy for AOC GW, Site-Wide Groundwater, since ongoing releases from AOCs or SWMUs have the potential to cause fluctuations in groundwater contaminant levels.
- Remedial Action – For the units where conservative industrial screening criteria were exceeded and exposure potential could not be managed with institutional controls, remedial action was recommended. No units were found to require remedial action.

CORRECTIVE ACTION FINAL REMEDIES

This part of the Statement of Basis provides the corrective action requirements for the solid waste management units and areas of concern that require implementation of a selected final remedy at the DuPont Chattanooga Plant. Exposure concerns for several of the SWMUs and AOCs require DuPont to maintain institutional and engineering controls. The Institutional Controls (ICs) will prevent exposures to the contaminated soils and groundwater by limiting site

access and use, and by enforcing other administrative/security measures. DuPont will be required to perform inspections to ensure that those ICs are being maintained and properly applied. Groundwater and surface water, which may be contaminated with VOCs and metals, will require long-term monitoring to ensure that human health and the environment remain protected.

SECURITY: The ICs in the draft permit provide the basic conditions for maintaining control and limiting access to the facility. Specific security measures to prevent exposures include:

- Maintaining, in good condition, the perimeter fence that surrounds the active portions of the facility;
- Restricting site access to the main plant by limiting access only to authorized employees, visitors and contractors, who must enter through the main gate, which is manned on a continuous basis by security personnel;
- Requiring that excavation permits be issued prior to any drilling, digging or other ground-intrusive activity to reduce the possibility that construction work will occur in or near a SWMU or AOC. This includes the proper management of areas downgradient of those units that may affect the route or rate of migration of a groundwater contaminant plume;
- Issuing work permits for activities conducted near SWMUs and AOCs to ensure that proper work practices, personal protective equipment (PPE), and decontamination procedures are followed;
- Using a combination of security personnel patrols, signage, and remote surveillance to ensure site security;
- Managing and limiting the active portion of the facility to industrial use only; and
- Posting signs and maintaining cover materials at SWMUs that exhibit constituent concentrations at levels exceeding relevant screening criteria.

MONITORING: For long-term monitoring requirements at the Chattanooga Plant site, DuPont shall semi-annually collect and analyze surface water and groundwater samples. The sampling locations with analytical criteria are shown on Figure 4. The following tables provide the analytical parameters for the long-term groundwater monitoring program at the site.

RCRA (Hazardous Waste) Criteria	
Parameter	**Method**
Benzene, cis-1,2-Dichloroethene, Tetrachloroethene, Trichloroethene, Vinyl chloride	EPA Method 8260B
Biphenyl, Diphenyl Ether, Bis(2-ethylhexyl)phthalate, Dibenzofuran, Phenol	EPA Method 8270C
PCB 1242	EPA Method 8082A
Arsenic, Barium, Boron, Iron, and Manganese	SW846 6010B

Landfill Criteria	
Parameter	**Method**
Arsenic, Boron, Cadmium, Chromium, Iron, Lead and Manganese	SW846 6010B
Chloride, Nitrate, and Sulfate	EPA Method 9056
Total Organic Carbon	EPA Method 9060
Mercury	EPA Method 7470A

The Landfill Criteria for the closed Coal Ash Disposal Landfill, SWMU 24, is in accordance with the Tennessee Solid Waste Management Regulations concerning post-closure care. The Division of Solid Waste Management has agreed that DuPont does not have to provide duplicative groundwater reporting to the Division's Solid Waste Management and Hazardous Waste Management Programs. A single report that meets the requirements of both programs [(Tennessee Rules 1200-1-7-.04(8)(e)6 and 1200-1-11-.06(6)(l)] shall be submitted in accordance with the reporting requirements of the hazardous waste management corrective action permit. DuPont's Long-Term Groundwater Monitoring Plan, which is included in the permit, is the same one approved by both programs. The Solid Waste Program shall retain authority for DuPont's compliance with the Coal Ash Landfill's Post-Closure Plan. Any corrective action response action for an exceedance or increasing trend in contaminant levels from SWMU 24 shall meet both program requirements.

Surface water samples will be monitored for Dowtherm® components (1,1'-biphenyl and diphenyl ether) and a potential breakdown product (phenol) using method SW846 8270C.

Monitoring wells MW-100, 105, 107, 108, 109, 110, 111, and 112 shall serve as the Point of Compliance for monitoring the environmental quality of site groundwater being discharged to the Tennessee River. In accordance with the long term groundwater monitoring plan, evaluation of groundwater analytical results from these wells indicate concentrations that are protective of human health and the environment. In order to evaluate constituent of potential concern (COPC) concentrations in the wells and confirm protection from contaminated groundwater discharging to surface water (Tennessee River), two types of data evaluation methods will be used at the site: Groundwater-to-Surface Water Discharge Analysis and Intra-Well Trend Analysis. These data evaluation methods are presented in detail below.

GROUNDWATER-TO-SURFACE WATER DISCHARGE ANALYSIS: DuPont shall perform a Groundwater-to-Surface Water Discharge Analysis for the 8 perimeter bedrock monitoring wells that serve to evaluate the quality of groundwater at the Point of Compliance (POC). Should action levels be exceeded in one of the POC monitoring wells, additional evaluation may be necessary. The action level used in the evaluation is a concentration in groundwater that is based on the ratio of the surface water screening criteria for a COPC to a conservative predicted surface water concentration of that COPC. This ratio indicates how much higher the groundwater concentration would have to rise before the surface water screening criteria in the receiving water body was exceeded.

The total contribution of site groundwater to the Tennessee River has been calculated by DuPont to be less than 10 cubic feet per second (cfs) on an annual basis. More than ninety years of data, as reported by the Tennessee Valley Authority for the Chickamauga Dam and Nickajack Reservoir, indicate that the average annual unregulated flow in the Tennessee River near the site is equal to 34,600 cfs. Therefore, it is anticipated that constituents present in the groundwater under the site entering surface water in the Tennessee River would be diluted by a factor of at least 3,460. To account for variable flow within the groundwater and surface water systems a conservative dilution factor of 1,000 could be applied to calculate a potential surface water concentration of constituents present in the groundwater. To calculate the predicted surface water concentration, the maximum concentration of a COPC detected in groundwater was divided by the dilution factor of 1,000.

The ratio of the surface water screening criteria to the predicted surface water concentration indicates how much higher the predicted surface water concentration would have to rise before the surface water screening criteria was exceeded. The action level was calculated by using the average concentration of a COPC multiplied by the ratio noted above (screening criteria: predicted concentration). By using the maximum and average concentrations, the action level calculations represent a conservative value with inherent safety factors. The data used to calculate the predicted surface water concentration, the ratios, and the resulting action levels are shown in Table 2. Groundwater concentrations from each sampling event will be compared to the action levels to determine if conditions at the site are protective. If a sample exceeds the action level for any COPC, further evaluation will be completed to determine if additional actions are required.

INTRA-WELL TREND ANALYSIS: Intra-well trend analysis will be performed on all wells sampled in the program. To determine if trends exist within specific wells at the perimeter and within the manufacturing area, a three point moving average analysis using historic and recent groundwater data will be implemented. The resulting data set (concentrations) will be plotted over time and a regression analysis (e.g. linear, best fit curve, etc.) will be performed. This analysis will indicate whether concentrations at that well are increasing, decreasing, or stable. Seasonal variations will also be examined to determine if those trends are present in the data. Increasing trends may warrant additional evaluation.

SURFACE WATER DATA EVALUATION: Surface water results from the downstream East Drainage Ditch will be compared to Tennessee Ambient Water Quality Criteria (TN AWQC). The surface water quality criteria are based on the lower of the values for protection of freshwater organisms (chronic) or protection of human health (drinking water and fish consumption). Where TN AWQC are not available, concentrations will be compared to USEPA Region 9 Preliminary Remediation Goals (PRGs) for tap water. To evaluate potential terrestrial ecological receptors, concentrations will also be compared to USEPA Region 4 Ecological Chronic Freshwater Screening Values. Screening criteria is not available for diphenyl ether. Therefore, concentrations will also be compared to site-specific screening values derived by DuPont. The site-specific screening levels were developed for protection of human health (drinking water use) and protection of aquatic life, but are considered protective for other potential human health uses (recreational) and ecological (terrestrial) receptors.

To determine if the conditions at the site are protective, surface water concentrations from each sampling event will be compared to the screening criteria presented in the following table:

Analyte	Units	TN AWQS Human Health	TN AWQS Aquatic Life	Region 4, EPA Chronic FW Value	Region 9, EPA PRG Tap Water
Diphenyl Ether	ug/L	-	1,104	-	680
Phenol	ug/L	21,000	-	256	10,950
Biphenyl	ug/L	-	NA (120)	-	304

- TN AWQS - Chapter 1200-4-3 Ambient Water Quality Criteria (January 2004)
- Human Health - Recreational Uses, drinking water consumption and fish ingestion
- PRG - USEPA Region 9 Preliminary Remediation Goal for tap water (November 2004 w/updates)
- Screening criteria for diphenyl ether is DuPont site-specific derived values
- NA (120) Tennessee or National value does not exist, value shown is North Carolina value

Sample results from the spring will also undergo trend analysis to determine if trends exist at that location. This analysis will indicate whether concentrations in the spring are increasing, decreasing or stable. If a sample exceeds the conservative screening criteria or an increasing trend is noted, further evaluation will be completed to determine if additional actions are required.

REFERENCES

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