



STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

OFFICE OF THE
SECRETARY

89 KINGS HIGHWAY
DOVER, DELAWARE 19901

PHONE: (302) 739-9000
FAX: (302) 739-6242

Secretary's Order No. 2012-A-0009

Re: Approval of Final Plan of Remedial Action for Hercules Road & Lancaster Pike Site near Wilmington, New Castle County (DNREC Project No. DE-1492)

Date of Issuance: March 22, 2012

Effective Date: March 22, 2012

The Secretary of the Department of Natural Resources and Environmental Control (Department) issues the following findings, reasons and conclusions as an Order of the Secretary following a public hearing.

Findings and Reasons

On November 28, 2011, the Department's Division of Waste and Hazardous Substances' Site Investigation and Restoration Section (SIRS) issued for public comment a proposed Plan for Remedial Action for the environmental remediation of portions of a 206 acre property (Site) located north of Wilmington, New Castle County near Hercules Road and Lancaster Pike. The Site is an area where the former Hercules Country Club golf course operated, which began operations with a 9 hole course in 1937 located on the east side of Red Clay Creek. The golf course expanded in 1941 to 18 holes with a 9 holes added south of the Site, and this area was the subject of the Department's environmental remediation that was completed in 2011. In 1967, the golf course added 9 holes on the west side of Red Clay Creek in 1967 that are included in this environmental remediation. All golf operations on the Site ceased in 2011.

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included a 2009 Phase 1 Remedial Investigation that discovered contaminants of concern likely the result of herbicide and pesticide applied to the golf course playing areas, namely, the fairways, greens and tee boxes and also around the maintenance storage areas where the chemicals were stored and handled. In 2010, a soil investigation of the Site's greens was conducted as part of another Remedial Investigation, which reviewed 245 soil samples, 14 sediment samples and 14 groundwater samples from throughout the Site.

The investigation by a Department approved contractor, determined no contaminants of concern in soils of non-playing areas of the golf course, but that the playing areas (fairways, greens and tee boxes) had levels of contaminants of concern that needed to be remediated.

In a July 21, 2010 Voluntary Cleanup Program Agreement application, Toll Bros. Inc. (Applicant) sought an agreement with SIRS for the environmental remediation of the Site. The Plan follows the earlier environmental remediation in 2009 of the 9 hole South Course, and remediated property has been developed for residential housing known as the Greenville Overlook (SIRS Project DE-1323).

SIRS held a public workshop on the Plan in December 2011, and, based upon the public interest at the workshop, determined to hold a public hearing.

On January 18, 2012, the Department held a public hearing on the Plan at the Department's Lukens Drive offices in New Castle. At the hearing, several members of the public asked questions about the Plan and the questions were answered by the Department's and Applicant's representatives.

The Department's presiding hearing officer prepared the attached Report, which reviews a record of decision and recommends approval of the Plan. The Report finds that

the Site was thoroughly investigated for hazardous substances, as identified in the investigation as contaminants of concern under HSCA.

The Department finds that the Site's use as a golf course resulted in the contamination of the soils from pesticide and herbicide application to the golf course's playing areas, namely, the tee boxes, fairways, and greens and to the pesticide and herbicide handling area. The Plan's environmental remediation will remove the most contaminated soil, and blend soil in other less contaminated areas so that the soil will be remediated to acceptable levels. The Plan's environmental remediation will allow the Site to be used for the Applicant's proposed residential development consistent with the Department's risk assessment.

The investigation of the Site included the detailed study of the groundwater and surface water for signs of contamination. The Department will also require that the implementation of the Plan will improve on dust control during the soil movement required by the blending and will require procedures learned during the environmental remediation of Greenville Outlook.

Conclusions

In sum, as more fully described in the reasons and findings in the Report, the Department finds and directs the following:

1. The Department has jurisdiction under its statutory authority to make a determination in this proceeding;
2. The Department provided adequate public notice of the proceeding and the public hearing in a manner required by the law and regulations;

3. The Department held a public hearing in a manner required by the law and regulations;

4. The Department considered all timely and relevant public comments in making its determination;

5. The Department shall issue the Final Plan of Remedial Action based upon the Proposed Plan of Remedial Action for the proposed residential use of the Site; and

6. The Department shall publish notice of this action on its web site and shall provide such other notice as required by the law or regulations.

A handwritten signature in black ink, appearing to read "Collin P. O'Mara", written in a cursive style.

Collin P. O'Mara
Secretary

HEARING OFFICER'S REPORT

TO: The Honorable Collin P. O'Mara
Secretary, Department of Natural Resources and Environmental Control

FROM: Robert P. Haynes, Esquire
Senior Hearing Officer, Office of the Secretary
Department of Natural Resources and Environmental Control

RE: Proposed Plan of Remedial Action for Hercules Road & Lancaster Pike Site Near
Wilmington, New Castle County (DNREC Project No. DE-1492)

DATE: March 7, 2012

I. BACKGROUND AND PROCEDURAL HISTORY

This Report considers the record of decision on the Proposed Plan of Remedial Action (Plan) dated November 28, 2011 prepared by the Department's Division of Waste and Hazardous Substances, Site Investigation and Restoration Section (SIRS).

The Plan is for environmental remediation of a 206 acre property (Site) located north of Wilmington, New Castle County along Hercules Road and Lancaster Pike. The Site was investigated for possible contamination based upon herbicide and pesticide applied to the land when the Site was used as a golf course from 1937 through 2011.

The environmental remediation is being undertaken pursuant to the Department's Voluntary Cleanup Program's (VCP) procedures based upon a VCP Agreement with Toll Bros. Inc. (Applicant). The Department's authority based upon the *Delaware Hazardous Substance Cleanup Act, 7 Del. C. Chap. 91* (HSCA) and the Department's *HSCA Regulations 7 DE Admin. Code 1375*.

The Department held a January 18, 2012 public hearing on the Plan, which was attended by approximately ten members of the public.

II. SUMMARY OF THE RECOMMENDED RECORD

Timothy Ratsep, SIRS' Program Administrator, Will Paul, SIRS' Program Manager, and Steven Johnson, a SIRS Environmental Scientist attended the hearing. The Department developed an administrative record consisting of the exhibits set forth in the appendix hereto. In addition, the Applicant's representatives, Mark Lannan and Craig Olsen of BrightFields

consultants, made a power point presentation (Toll Bros Ex 1). They explained the testing and sampling that occurred as part of the investigation of the Site and the Plan's remediation by soil removal of the most contaminated areas and soil blending of areas that could be remediated by blending.

The presentation explained that the Site's history and development of the golf course when operated as the Hercules Country Club. The first nine hole golf course was constructed on the east side of Red Clay Creek in the 1930s. In 1941 a second nine hole golf course was built south of the initial 9 hole course, and this area was the subject of a remediation completed in 2011 in order to build the Greenville Overlook residential development. In 1967-68 a second nine hole golf course was built on the west side of Red Clay Creek that is included as part of the Site. The Site's use for golf ceased in 2011.

The golf course operations used a storage barn for mixing pesticides and herbicides and loading them on to the equipment to apply to the golf course's greens, tee boxes and fairways. The Site's investigation identified those areas where there is a higher level of contaminated soil, and the Plan's proposed remediation would blend and/or remove soil so that the soil meets the Department's standards and testing, monitoring and remediation work to be based upon Department approved protocols.

Public comments were received from Bill Dunn, who is the Vice-President of the Milltown-Limestone Civic Alliance. He asked questions about the remediation of the tee boxes and the investigation of dioxin from Hercules Corporation's research and development facility that is located adjacent to the Site. Amanda Gonye provided public comments as a neighbor and expressed concerns with groundwater contamination, dioxin contamination, and the dust control problems experienced with the remediation that was already completed and wanted assurances that problems would not occur with the Site's remediation. The Owner and Department representatives provided answers to her questions and the Owner notes that the remediation that

occurred provided experience that would be used in the remediation of the Site to reduce problems. The Department's Doug Zeiter provided and explanation of the groundwater testing and explained that dioxin contamination was not present and the degradation of dioxin occurs over time. Robert Hamilton provided comments that asked about whether the investigation has interviewed the greenskeepers or looked at records and whether an area would be developed, and was provided answers by the Owner's representatives. Jason Fischel asked questions about the groundwater investigation and testing of the stormwater management water and was provided answers.

III. DISCUSSION OF RECOMMENDED FINDINGS AND REASONS

I recommend that Plan be approved as consistent with the procedures required by HSCA and the Department's HSCA Regulations. The Plan's environmental remediation should remediate the Site to meet the Department's standards for the Site's proposed use for residential development. The Plan follows the successful environmental remediation of the adjoining area that once was the South Course of the Hercules Country Club, but now has been redeveloped as the Greenville Outlook residential development.

The Plan identified as contaminants of concern based upon the Site's past use as a golf course that had herbicide and pesticide chemical applied to the fairways, greens and tee boxes and spillage from where the chemicals were handled in the storage building. Brightfields' investigation extensively tested the soil and groundwater of the Site based upon a Phase 1 Remedial Investigation in 2009, the 2010 preliminary investigation of the soils around the greens, and the 2011 Remedial Investigation that reviewed 245 soil samples, 14 sediment samples from the waterways, and 14 groundwater samples from monitoring well installed. A supplemental investigation reviewed 28 soil samples.

The Plan proposes soil excavation and removal to off-site disposal site of the soil that is the most contaminated by the equipment barn and the greens on the oldest golf course to the west

of Red Clay Creek, while the fairways and tee boxes would have the top 2 feet of soil mixed with deeper soil to achieve the level of remediation required by the Department based upon test results. The newer golf course to the east of Red Clay Creek would have the greens' soil removed, but no other remediation was required except for the fairway for hole 5, which would have soil blending. The golf course remediation will be confirmed by testing and monitoring, and a Site will require a Remedial Action Work Plan to be submitted for SIRS approval. The Site also will need to submit a Contaminated Materials Management Plan for SIRS approval.

IV. RECOMMENDED CONCLUSIONS

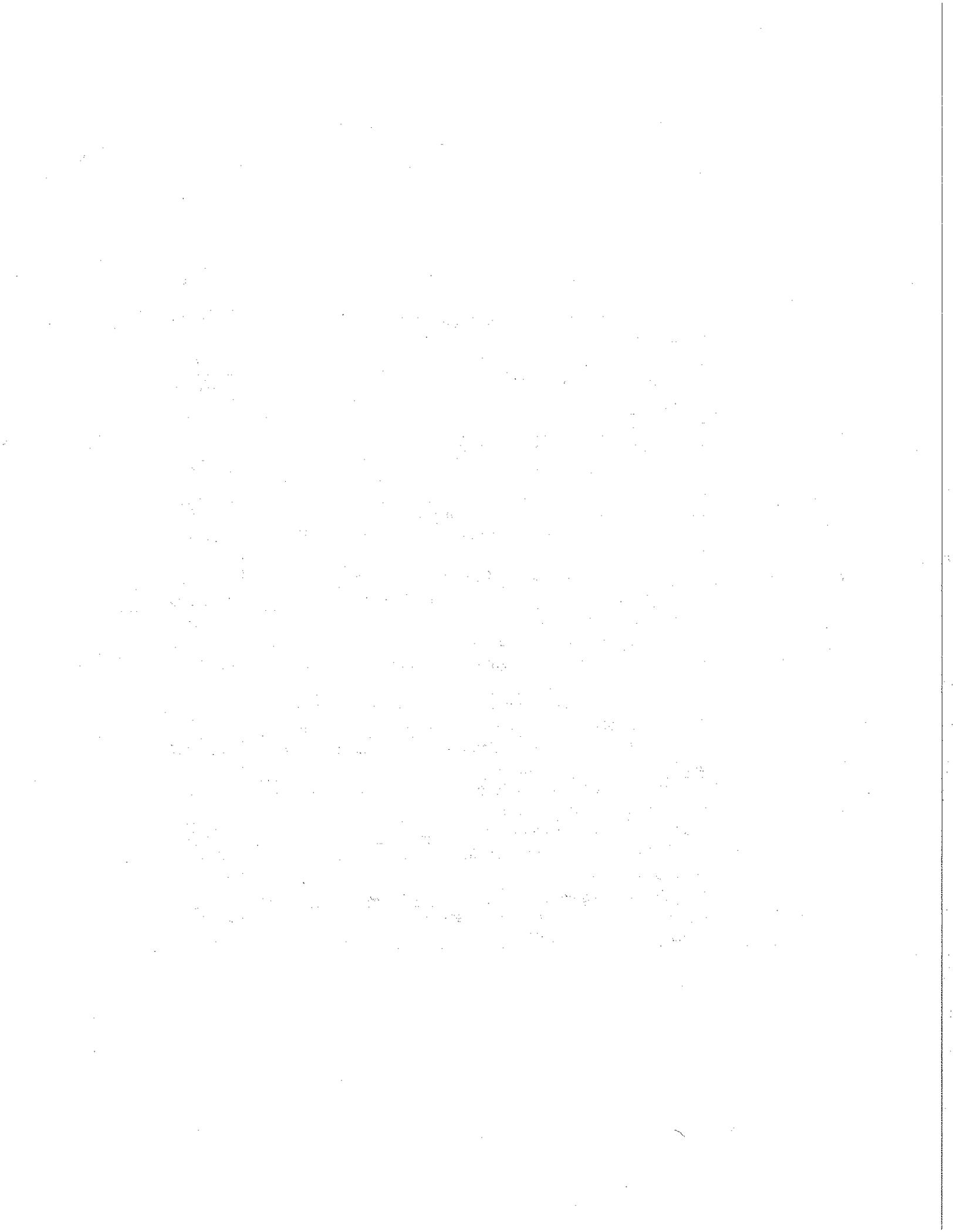
Based on the record, I recommend approval of the Plan of Remedial Action. In conclusion, I recommend the Secretary adopt the following findings and conclusions:

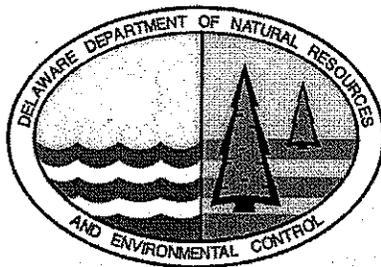
- 1.) The Department has jurisdiction under its statutory authority to make a determination in this proceeding;
- 2.) The Department provided adequate public notice of the proceeding and the public hearing in a manner required by the law and regulations;
- 3.) The Department held a public hearing in a manner required by the law and regulations;
- 4.) The Department considered and responded to all timely and relevant public comments in making its determination;
- 5.) The Department's proposed Plan of Remedial Action is consistent with the law, regulations, and the Department's policies and is hereby adopted as a final Plan of Remedial Action; and that
- 6.) The Department shall publish this Order on its web site and provide such notice as required by law and regulation.


Robert P. Haynes Esquire
Senior Hearing Officer

Public Hearing for the Proposed Plan of Remedial Action for the
Hercules Road and Lancaster Pike Site:
List of Exhibits Submitted by the Site Investigation & Restoration Section

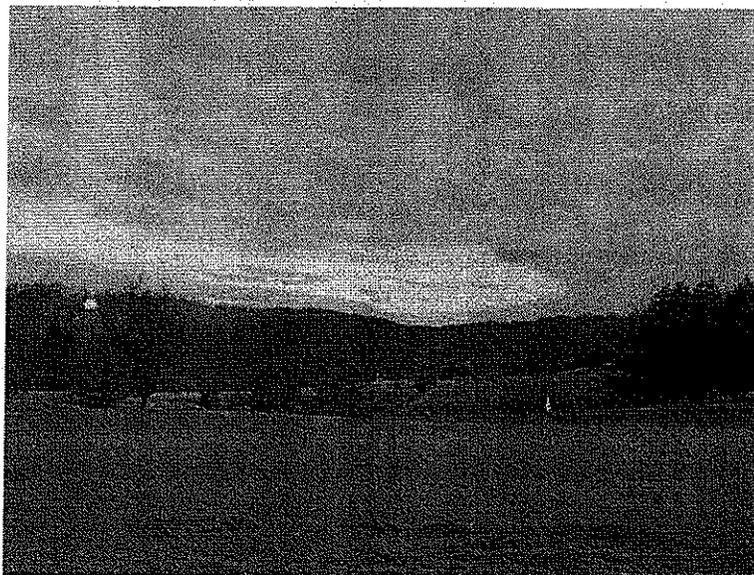
Exhibit Number	Document Title and Subject	Date
1	DNREC letter requiring settlement agreement for investigation of site under HSCA	7/10/2010
2	Voluntary Cleanup Program Application	7/27/2010
3	Legal Notice of DNREC-Toll Bros negotiations for a VCP agreement	8/1/2010
4	Voluntary Cleanup Agreement	
5	Remedial Investigation (RI) Work Plan	7/28/2010
6	RI Work Plan Approval letter	8/2/2010
7	Remedial Investigation Report	7/15/2011
8	Supplemental Sampling Plan and Approval (e-mail)	8/3/2011
9	Revised Remedial Investigation Report (addendum to 7/15 draft)	10/24/2011
10	Remedial Investigation Report Approval	11/10/2011
11	Proposed Plan of Remedial Action & Legal Notice	11/30/2011
12	Notice of Public Hearing	12/28/2011
13	Addendum to RI Report, Appendix G	1/5/2012
14	Focused RCRA Facility Investigation of Former Agricultural Laboratory	2/7/2006
15	Letter to Bryan Ashby RE: Response to Comments on Former Agricultural Laboratory Focused RCRA Facility Investigation	2/10/2006
16	Memorandum RE: Recommendation concerning sampling for dioxin at Hercules Golf Course	5/1/2007
17	Update to the ATSDR Policy Guidance for Dioxins and Dioxin-like Compounds in Residential Soil	2/2008
18	Lab Results: 3 soil samples (+ field duplicate) for TCDD	7/6/2007
19	National Primary Drinking Water Regulations: Technical Fact Sheet on DIOXIN http://www.epa.gov/ogwdw/pdfs/factsheets/soc/tech/dioxin.pdf	2011
20	Agency for Toxic Substances and Disease Registry: DIOXINS and FURANS	2011





PROPOSED PLAN OF REMEDIAL ACTION

Hercules Road & Lancaster Pike Site
Wilmington, Delaware
DNREC Project No. DE-1492



November 2011

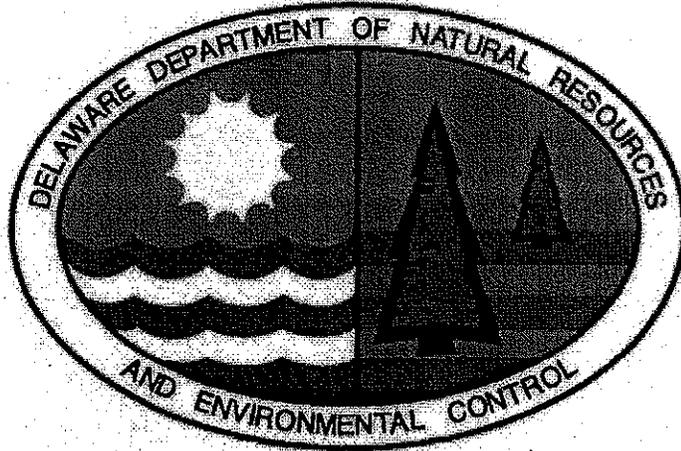
Delaware Department of Natural Resources and Environmental Control
Division of Waste and Hazardous Substances
Site Investigation & Restoration Section
391 Lukens Drive
New Castle, Delaware 19720

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PROPOSED PLAN OF REMEDIAL ACTION

Hercules Road & Lancaster Pike Site
Wilmington, Delaware
DNREC Project No. DE-1492



Approval:

This Proposed Plan meets the requirements of the Hazardous Substance Cleanup Act.

Approved by:

Marjorie A. Crofts, Director
Division of Waste and Hazardous Substances

11.28.11

Date



What is the Hercules Road & Lancaster Pike Site?

The Site is the former location of the Delaware National Country Club. The Site is depicted in Figure 1. The developer (Toll Brothers, Inc.) entered into the Department of Natural Resources and Environmental Control - Site Investigation and Restoration Section's (DNREC-SIRS) Prospective Purchase Agreement (PPA) to conduct a remedial investigation (RI) of the property under the provisions of the Delaware Hazardous Substance Cleanup Act (HSCA), 7 Del. C. Chapter 91. Through the PPA, Toll Brothers, Inc., agreed to investigate the potential risks posed to public health, welfare and the environment at the Site.

Tax Parcel Numbers: 08-027.00-001, 08-027.00-007, 07-031.00-014, and 07-031.00-001
Address: 0 Hercules Road, 400 Hercules Road, 0 Penn Oak Drive, and 5600 Lancaster Pike, Wilmington, Delaware
Nearest major intersection: Hercules Road and Lancaster Pike
Surrounding Property: Surrounding land use is generally residential, commercial, and industrial. Numerous residences and several roads surround the subject property. The Ashland (formerly Hercules) Research Center, which consists primarily of research and product development laboratories, operates on most of the property to the south.
Zoning: S-UDC-Suburban
Site Utilities: Electric, water, sewer are provided by public utilities. The research center operates a private supply well.
Surface water: The Red Clay Creek flows through the center of the Site.
Topography: The topography varies across the Site ranging from 80 to 200 feet above sea level. The Site was formerly used as a golf course and is predominantly covered by vegetation and woodland.
Groundwater: Groundwater was encountered at depths ranging from 7 to 28 feet below ground surface. The groundwater is controlled by topography and appears to flow in multiple compass directions. Groundwater in the overburden is only encountered in areas with a sufficient thickness of soil material above bed rock and is generally confined to lowland areas. Groundwater generally flows toward the Red Clay Creek.

What happened at the Hercules Road & Lancaster Pike Site?

The Site was historically maintained primarily as wooded land until it was developed as a golf course by the Hercules Country Club starting in the late 1930s (the eastern side of the Site was not developed until the 1960s). The Site has been consistently used as a golf course and country club until 2011 and is currently vacant. Site investigations indicate that a small portion of the Site around the red equipment barn has been filled (2 - 3 feet deep).

What is the environmental problem at the Hercules Road & Lancaster Pike Site?

Environmental investigations indicate the following problems:

- Arsenic, chlordane, heptachlor epoxide, and mercury are contaminants of concern (COCs) in the surface soil in the former golf course playing areas (tees, fairways, and greens).
- Arsenic, barium, DDT, dieldrin, PCBs, and toxaphene are localized COCs in the surface soil around the equipment barn.

The older parts of the golf course, on the west side of Red Clay Creek, are significantly more contaminated with arsenic than the newer parts.

Except for the PCBs at the equipment barn, which have been fully delineated, the soil contamination found on the site is associated with the storage and use of chemicals and equipment for maintenance of the golf course.

There is no significant contamination of groundwater or sediment at the Site.



Photo 1. Sixty years of active golf course maintenance left residual traces of fertilizer and pesticides in the soil of the tees, greens and some fairways.

The following environmental investigations were performed on the Hercules Road & Lancaster Pike Site:

1. 2009: BrightFields, Inc. conducted a Phase I Environmental Site Assessment. The Phase I found that because the use of the subject property as a farm, country club and golf course, the use of the adjacent property (Ashland Research Center) as an industrial research and development facility, and the presence of underground storage tanks at the subject Site and adjacent properties, the soil and/or groundwater may have been impacted by pesticides and petroleum products.
2. 2010: BrightFields collected 22 preliminary soil samples from the golf course greens and tee boxes to assess arsenic concentrations. All samples were chemically screened using BrightFields' Innov-X Alpha series X-Ray Fluorescence Analyzer (XRF). Based on the screening results, soil samples from nine greens were submitted to a commercial lab for confirmatory analysis of metals and a targeted list of chlorinated pesticides. The older course holes (those constructed in 1937, located west of the Red Clay Creek) had elevated concentrations of arsenic and other compounds in the soil, while the newer holes (those constructed around 1967, located east of the Red Clay Creek) did not have elevated concentrations of arsenic. This is consistent with the phase out of arsenic insecticides after World War II.
3. 2011: BrightFields conducted a Remedial Investigation (RI) of the Site. Arsenic, chlordane, heptachlor epoxide, and mercury are COCs in the surface soil in the former golf course playing areas (tees, fairways, and greens). Arsenic, barium, DDT, dieldrin, PCBs, and toxaphene are localized COCs in the surface soil around the equipment barn.

The soil sample results from the RI indicate that the soil at the greens associated with the 18 holes on the northern course sections contain elevated concentrations of arsenic and pesticides. The concentrations of arsenic found on the older greens (those developed circa 1937, located on the west side of the Red Clay Creek) are greater than the arsenic concentrations on the newer greens (those developed circa 1967, located on the east side of the Red Clay Creek). Upon further review of the data, the tees and fairways located on the older side of the Site also exhibit elevated levels of arsenic compared to expected background concentrations, while the tees and fairways of the newer side do not (with the exception of the fairway on Hole 5).

4. 2011: BrightFields conducted a Supplemental Soil Investigation to obtain sufficient analytical soil data, compliant with Delaware's Hazardous Substance Cleanup Act (HSCA) standard operating procedure, to evaluate whether the golf course fairways and tee boxes on the eastern portion of the Site require remediation. The investigation results confirmed that soil remediation is not required on the former golf course fairways and tee boxes located on the newer side of the Site (east of the Red Clay Creek) with the exception of the fairway on Hole 5.

What does the owner want to do at the Hercules Road & Lancaster Pike Site?

Toll Brothers will develop the Site into multiple residential neighborhoods, which will include a total of 264 homes and consist of both single family and town home units. Redevelopment will include the construction of houses and the installation of utilities, streets, and landscaping. The Site redevelopment plan is depicted in Figure 2.

What remedial actions are proposed at the Hercules Road & Lancaster Pike Site?

The objective of this Proposed Plan is to accommodate future residential use of the Site through a combination of soil excavation for off-site disposal and on-site soil blending. The selected method depends on the contaminant concentrations in the soil. The PCB containing soil under and around the equipment barn foundation will be excavated and removed for off-site disposal. The remediation areas are shown on Figure 3.

DNREC requires the following remedial actions be performed on the Hercules Road & Lancaster Pike Site:

1. The soil on the former golf course fairways and tee boxes on the older side of the Site (west of the Red Clay Creek) will be remediated through the blending of the shallow soil with deeper soil as required to accommodate future residential use. Soil samples will be taken and analyzed subsequent to the soil blending process to confirm that the appropriate blending depth was used to meet residential cleanup standards.
2. The soil on the fairway at Hole 5 will be remediated in the same manner as the fairways on the old side of the Site.
3. The soil on all of the former golf course greens across the Site will be remediated through soil excavation and removal. Field screening with an XRF in combination with confirmatory laboratory analysis will be utilized subsequent to the soil excavation and removal process to assess that the appropriate excavation depth was used to accommodate future residential use of the Site.
4. The Site developer will prepare a Site Specific Remedial Action Work Plan (RAWP), subject to DNREC approval, to address the specific methods to be used to remediate the Site.
5. The Site developer will prepare and implement a Contaminated Materials Management Plan (CMMP) to ensure that contaminated materials are appropriately managed and/or disposed off-site and a Health and Safety Plan for Site workers and the public during remedial activities. These plans and their implementation shall be subject to DNREC approval and oversight.

What are the long-term stewardship requirements are proposed for the Hercules Road & Lancaster Pike Site?

The Site will be redeveloped into a residential community after the cleanup. There will be no additional monitoring requirements. The Site will be eligible for a Certification of Completion of Remedy once the residential cleanup standards are achieved.

How can I find additional information and/or comment on the Proposed Plan?

The complete file on the Site, including the Environmental Site Assessment and the Brownfield Investigation report, is available at the DNREC office, 391 Lukens Drive in New Castle. Most documents are also found on:

<http://www.nav.dnrec.delaware.gov/DEN3/>

The public comment period begins on Wednesday, November 30, 2011, and ends at close of business (4:30 pm) on Tuesday, December 20, 2011. Please send written comments to the DNREC office or call Stephen Johnson, Project Manager, at: 302-395-2600.

SFJ:tlw; SFJ11017.doc; DE 1492 II B8

Glossary of Terms Used in this Proposed Plan

Contaminants of Concern (COC)	These are potentially harmful substances at concentrations above acceptable levels (e.g. metals and PAHs).
Certification of Completion of Remedy (COCR)	A formal determination by the Secretary of DNREC that remedial activities required by the Final Plan of Remedial Action have been completed.
Final Plan of Remedial Action	DNREC's proposal for cleaning up a hazardous site after it has been reviewed by the public and finalized.
Hazardous Substance Cleanup Act (HSCA)	Delaware Code Title 7, Chapter 91. The law that enables DNREC to identify parties responsible for hazardous substances releases and requires cleanup with oversight of the Department.
Proposed Plan of Remedial Action	DNREC's initial plan for cleaning up a hazardous site, which is subject to public comment before being adopted as final.
Remedial Investigation (RI)	Thorough environmental study of a site which includes 1) sampling of site environmental media and/or wastes on the property and 2) conducting a preliminary risk assessment using the data collected to determine the risk posed to human health and the environment.

What is a *Proposed Plan*?

A Proposed Plan of Remedial Action (Proposed Plan) is a summary of how DNREC plans to clean up a contaminated site. A Final Plan of Remedial Action (Final Plan) is the adoption of the Proposed Plan after all comments made by the public, within the comment period of twenty days, have been considered and addressed by DNREC.

The Delaware State Legislature passed the Hazardous Substance Cleanup Act (HSCA) in 1990. The Legislature made sure that members of the public would be informed about environmental problems in their own neighborhoods and have a chance to express their opinion concerning the cleanup of those environmental problems before DNREC takes action.

After DNREC studies a Site, it summarizes the problems there and proposes one or more possible solutions in a Proposed Plan. The Proposed Plan contains enough information to allow lay persons to understand the Site. More detailed information can be found in the reports and documents approved by DNREC. All of the documents and reports created by DNREC or consultants during the course of the investigation of the Site are available to the public at the offices of DNREC-SIRS or at DNREC's Delaware Environmental Navigator website:

<http://www.nav.dnrec.delaware.gov/DEN3/>

DNREC issues the Proposed Plan by advertising it in at least one newspaper in the county where the Site is located. The legal notices for the Proposed Plans and the Final Plans usually run on Wednesdays or Sundays in the legal classified section of the News Journal and/or the Delaware State News. The public comment period begins on the day (Wednesday), or the day after (Sunday) the newspaper publishes the legal notice for the Proposed Plan.

DNREC frequently holds public meetings during the comment period. Those meetings are usually held during a weekday evening, at a location near the Site. Citizens can request a public meeting if DNREC did not already schedule one.

The public may comment on the Proposed Plan by letter or email, or at the public meeting. DNREC considers all comments and questions from the public before the Proposed Plan is finalized and adopted as a Final Plan.

