

**CABOT**

RECEIVED

U.S. EPA, REGION V  
WASTE MANAGEMENT DIVISION  
OFFICE OF THE DIRECTOR

December 31, 1987

Ms. Susan Swales (5HE-12)  
USEPA  
230 South Dearborn Street  
Chicago, Illinois 60604

RE: Request for Information - Fields Brook, Ashtabula County, Ohio

Dear Ms. Swales;

Enclosed please find Cabot Corporation's Responce to the Request for Information letters of November 23 and 30, 1987 to Cabot Corporation and Cabot Titania, Inc. c/o Cabot Corporation in accordance with Steven Kuhrtz earlier letter to you dated December 2, 1987.

Cabot Titania, Inc. no longer exists, having been merged into Cabot Corporation in 1980. Accordingly, the Responce is filed only by Cabot. Cabot's connection with the site was as a shareholder in the company owning and conducting the operations described in the Responce and as a provider of management services to the owner-operator.

You will note that certain information requested is still being collected with regards to questions #4, 5 and 37. We are in the process of securing the documents and information responsive to these requests; to the extent these materials are available, we will supplement our Responce as soon as possible.

Please feel free to contact me should you have any questions.

Sincerely,

Wayne M. Reiber  
Corporate Pollution Control Officer

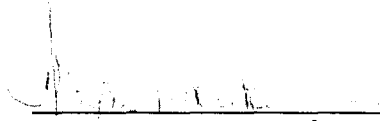
cc: SGKuhrtz/DJRobinson  
GRScoll

WMR/wmr

**Cabot Corporation**  
95 Winter Street  
P.O. Box 9073  
Waltham, Massachusetts 02254-9073  
(617) 890-0200

I, Wayne M. Reiber, Corporate Pollution Control Officer for the Cabot Corporation, hereby state as follows:

All information contained within this response, dated December 31, 1987, to the U.S.E.P.A. Region V, Request for Information dated November 6, 1987, pursuant to Fields Brook, Ashtabula County, Ohio, is true and accurate to the best of my knowledge and belief.

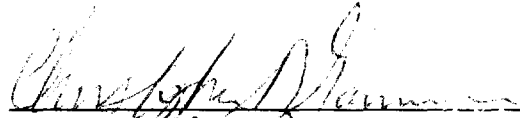
  
\_\_\_\_\_  
Wayne M. Reiber

COMMONWEALTH OF MASSACHUSETTS

County of Middlesex, ss.

December 31, 1987

Then personally appeared before me the above-named Wayne M. Reiber and acknowledged the foregoing instrument to be his free act and deed, before me

  
\_\_\_\_\_  
Notary Public  
My Commission expires: Apr 13, 1990

1. Cabot Corporation was incorporated in the State of Delaware in 1960 and maintains principal executive offices at:

950 Winter Street  
P.O. Box 9073  
Waltham, MA 02254-9073

The registered agent for the Cabot Corporation is:

C.T. Corporation Systems  
208 South LaSalle Street  
Chicago, IL 60604

2. Cabot Titania Corporation (CTC), incorporated on October 11, 1962, operated a titanium tetrachloride/titanium dioxide production facility located at the intersection of State Road and Middle Road in Ashtabula, Ohio. Cabot Corporation and Ruberoid Company were stockholders of CTC.

Under a Service Agreement between Cabot Corporation (Cabot) and CTC, Cabot furnished CTC with management, sales, and technical services.

CTC changed its name to Titanium Chemicals, Inc (TCI) on May 17, 1967. Cabot Corporation was sole stockholder of TCI.

TCI was reorganized in May 1967 to Cabot Titania, Inc. (CTI). As part of this reorganization, TCI transferred all assets to CTI. CTI carried on the operations of TCI until 1972 when it entered into a Lease Agreement with New Jersey Zinc Company (NJZ).

New Jersey Zinc Company operated the facility from June 1, 1972 under a lease agreement until it purchased the facility in 1975.

3. By Assets Sales Agreement, Lease Agreement, and License Agreement dated June 1, 1972 between the New Jersey Zinc Company (NJZ), a division of Gulf and Western Industries, Inc, and Cabot Titania, Inc. (CTI) and Cabot Corporation (CABOT), NJZ entered a three (3) year lease of the Ashtabula  $TiO_2$  production facility with an option to purchase. NJZ exercised that option and purchased all assets of CTI on June 1, 1975.
4. & 5. Information relevant to these questions is still being collected and will be submitted in a supplement Responce.
6. By Contract of Sales agreement dated August 22, 1962 between National Distillers and Chemical Corporation, at that time located at 99 Park Avenue, New York, NY, and Cabot Corporation (CABOT), Cabot purchased a titanium tetrachloride production facility located at the intersection of State Road and Middle Road in Ashtabula, Ohio. The purchase was an asset purchase and Cabot, therefore, believes that National Distillers and Chemical Corporation and Reactive Metals, Inc. may be liable for actions arising out of their operations at the facility.

The purchase consisted of approximately 44 acres of property with a  $TiCl_4$  production facility built by Stauffer Chemical Company in 1958. By this purchase, Cabot exercised its option under an agreement dated January 1, 1961 between Cabot Corporation and Reactive Metals, Inc. under the terms of which Cabot had been granted an option to purchase the titanium tetrachloride plant. National Distillers and Chemical Corporation was successor by merger to Reactive Metals Inc.

By agreement dated July 22, 1962, between Cabot Corporation and Lummus Company, the Lummus Company agreed to design and construct a titanium dioxide facility. The  $TiO_2$  facility began production in 1964.

By Agreement dated October 11, 1962 Cabot Corporation and Ruberoid Co. of New Jersey entered into a pre-incorporation agreement to organize Cabot Titania Corporation.

7. Personnel records are not available which would indicate the name, position held, dates of employment, and current addresses of key managerial personnel at the facility. The following names have been obtained from information that is available.

Plant Manager:            Thomas Goodgame  
                              Ed J. Holland  
                              Fred R Mohrman

Production Manager:    H. Weaver (deceased)  
                              F. R. Mohrman ( $TiO_2$  facility)  
                              D. W. Johnson ( $TiCl_4$  facility)

Chief Engineer:         J.H. Thornton

8. The titanium tetrachloride production facility was owned and operated by National Distillers and Chemical Corporation, successor by merger to Reactive Metals, Inc.

The titanium tetrachloride and the titanium dioxide production facility was sold to New Jersey Zinc Company, a division of Gulf and Western Industries.

9. Cabot Titania Corporation pleaded nolo contendere to violations of the Rivers and Harbors Act of 1899 (U.S. District Court for the Northern District of Ohio - Eastern Division; CR 71-304, April 24, 1972). The violation was for depositing refuse and suspended solids into Fields Brook.

There are indications that Cabot Titania Corporation encountered difficulties in meeting water quality standards of the water discharge permit in effect at that time. The difficulties apparently resulted from the sludge removal system which at times could not handle the solid loading from treatment of the impurities present in the titaniferous ore.

10. Cabot has no knowledge or information regarding any contamination of the titanium tetrachloride production facility by National Distillers and Chemical Corporation or Reactive Metals, Inc.
11. Cabot has no other information available concerning sources of contamination to Fields Brook other than that which has been made available by the USEPA or discussed in Answer #9.
12. Cabot has not retained detailed information such as blueprints that would provide information concerning sewer lines on the  $TiO_2/TiCl_4$  production facility. This type of information would most likely have been conveyed to NJZ at the time of their purchase of the facility. There is indication that a main sewer line does exist on the titanium dioxide production facility and the line collected non-contact cooling water as well as effluent from the sedimentation lagoons. Sanitary waste was separated from the plant wastewaters, treated in a septic tank and discharged to Fields Brook after passing through a sand filter.
13. Cabot Corporation has not retained detailed information concerning this type of information. Information available concerning the wastewater treatment process however, indicates that a trench existed to convey wastewater from the rutile recovery system first stage neutralization pit to the second stage neutralization pit. This trench was located on the  $TiCl_4$  production area. A drain culvert also existed on the  $TiO_2$  facility which collected storm water runoff from non-production areas, non-contact cooling water and maintenance area washdown. This culvert discharged to Fields Brook.
14. The facility discharged to Fields Brook under a permit issued by the Water Pollution Control Board of the State of Ohio Department of Health. The permit was issued by the board acting pursuant to regulations adopted under Chapter 6111 of the Ohio Revised Code. Cabot has not retained copies of this permit and therefore, is unable to provide any details concerning its content.
15. The titanium tetrachloride/titanium dioxide production facilities located at the Ashtabula location consisted of two production plants operated under the same plant management. One facility manufactured titanium tetrachloride ( $TiCl_4$ ) which was either sold as a product or utilized as feedstock for the production of titanium dioxide ( $TiO_2$ ) in the second facility.

The titanium tetrachloride production facility was operated by the previous owners prior to commencement of operations under Cabot Titania Corporation. The titanium dioxide production facility commenced operations sometime in 1964. It is not known if the titanium tetrachloride facility was in production from the time Cabot Titania Corporation was organized in 1962 to the time titanium dioxide production operations commenced. Operations continued until the facility was leased to NJZ in 1972.

Titanium dioxide ( $\text{TiO}_2$ ) is obtained from titanium minerals present in naturally occurring titaniferous ores (ores in which the main constituents are natural titanium dioxide and iron oxides). The principal titanium minerals are ilmenite, laucoxene, and rutile. The titanium dioxide in pigments is a manufactured titanium dioxide, that is, it is obtained by either the chloride process - chlorination of a titanium mineral followed by oxidation of the resultant chloride; or the sulfate process - digestion of a titanium mineral with concentrated sulfuric acid to yield a soluble sulfate and subsequent hydrolysis of the sulfate to yield a titanium dioxide precipitate. The Cabot Titania facility produced titanium dioxide by the chloride process.

Rutile ore, utilized at the Cabot Titania facility typically contained 90-95% titanium dioxide, the balance constituent being primarily iron ore. Other minor constituents include moisture, alumina, silica, magnesia, lime, zircon, and oxides of chromium, niobium, aluminum and vanadium.

In the chloride process utilized at Ashtabula, titaniferous rutile ore feedstock was chlorinated in the presence of carbon (coke) to titanium tetrachloride ( $\text{TiCl}_4$ ) and chlorides of the various impurities present in the ore (mostly iron chlorides). The crude titanium tetrachloride was then condensed, separated from the other chlorinated products and purified by distillation. The purified titanium tetrachloride was either sold as a product or placed in storage for use as feedstock in titanium dioxide production.

To produce titanium dioxide, the titanium tetrachloride feedstock was reacted in the vapor phase with oxygen (vapor-phase oxidation) in the presence of silicon tetrachloride, aluminum chloride, and carbon monoxide to form titanium dioxide. The solid titanium dioxide was then collected by baghouses.

Dependent upon the type of pigment being produced, the pure titanium dioxide was either bagged directly after cooling or conditioned with water for the coating process.

Manufactured titanium dioxide was often coated with hydrous titania, alumina, and silica to achieve the desired pigment grade. The resulting coated pigment was then dried in dryers, cooled and bagged.

16. Hazardous substances, as defined by section 101 of CERCLA that may have been contained in any by-product or wastes from the manufacturing process are as follows:

Vanadium oxide: Vanadium was known to be present in minute quantities in the titaniferous ore feedstock. Vanadium chloride would have resulted from the chlorination process which would have been oxidized to Vanadium oxide in the wastewater treatment system.

Chromium compound: Chromium was known to be present in minute quantities in the titaniferous ore feedstock. Any chromium present would have been chlorinated and subsequently oxidized to chrome oxide in the wastewater treatment system.

Chlorine: Chlorine gas resulted from the oxidation process where titanium tetrachloride was oxidized to titanium dioxide. The chlorine was recovered and retained for use in the process

The quantities of these materials generated by the process is unknown.

17. Titanium Tetrachloride Production:

Process wastewater from operation of the spray dryer in the rutile recovery process and other process area wastewater received preliminary pH adjustment in the plant by the addition of lime. These wastewaters were then discharged to a trench which transported the wastewaters to wastewater treatment. In addition, process area washdown and some storm water entered this trench. From the trench the water flowed to a neutralization pit where lime was again used for second stage neutralization. The wastewater then flowed through a rectangular clarifier and discharged to Fields Brook. Underflow solids from the clarifier went to a vacuum filter for dewatering. Because the vacuum filter was of insufficient size to handle all the solids, the excess was concentrated in two lagoons located adjacent to the clarifier.

Titanium Dioxide Production:

Process wastewater from the titanium dioxide production facility was collected in a sump and pumped to four clarification lagoons. En route, polymer was added to enhance sedimentation. Effluent from the ponds joined the main sewer line which discharged to Fields Brook. The main sewer line also collected non-contact cooling water.

18. Cabot has no records or information concerning recordkeeping practices relating to any storage, disposal, or treatment practice for the by-products or waste associated with the manufacturing process described in Answer #15.

19. Chemical reclamation processes at the titanium tetrachloride/titanium dioxide production facility were incorporated directly into the production process to reclaim raw materials from waste streams for reuse in the manufacturing process.

Chlorine Recovery

Chlorine gas was used in the chlorination process to produce titanium tetrachloride and recovered during oxidation of titanium tetrachloride to titanium dioxide. The recovered chlorine was recycled for reuse in the initial chlorination process.

The chlorine rich effluent following the oxidation process and product collection baghouses was cooled and passed through a sulfuric acid scrubber where minute quantities of water and titanium dioxide were removed. The gas stream was then compressed and entered the chlorine recovery unit. The chlorine reacted with sulfur monochloride to produce sulfur dichloride. The chlorine was recovered by boiling the sulfur dichloride which then reverts to sulfur monochloride giving up the gaseous chlorine and is then cooled and recycled to the absorption system. The stripped effluent gas from the absorption system, primarily CO<sub>2</sub> and O<sub>2</sub> was vented to the atmosphere. The recovered chlorine was returned to the titanium tetrachloride production process.

#### Rutile Recovery

Unreacted titaniferous ore from the chlorination process reactors were separated from the reactive gases by a separator as detailed in answer #15. The solids from the separator plus other waste streams were sluiced with water to the rutile recovery unit to recover the titaniferous ore. After leaving the rutile recovery unit, the waste stream containing dissolved metal chlorides was neutralized with lime to precipitate the metals as hydroxides. Rotary filters removed the precipitated solids and the clear filtered water, containing only dissolved calcium chloride was discharged.

20. Cabot has no knowledge of the nature of any records or recordkeeping practices maintained relating to chemicals processed as described in answer #19. Chemicals were not received for reclamation from off-site sources.
21. The chlorine recovery system described in answer number #19 generated non-contact cooling water. The system removed chlorine gas from the process effluent gas stream prior to exhaust to the atmosphere. The chlorine depleted exhaust gas contained primarily CO and CO<sub>2</sub>.

The rutile recovery system generated a wastewater discharge that contained metal chlorides resulting from chlorination of metal impurities present in the titaniferous ore. The presence of chlorine made the wastestream acidic. The rutile recovery system provided preliminary pH adjustment with lime in the unit to provide partial neutralization and precipitation of metal oxides.

22. Cabot has no records relating to the characteristics and nature of the waste or by-products described in answer #19. It is known that certain sampling, analysis, and reporting requirements were performed in accordance with the requirements of the discharge permit. Cabot has not, however, retained those records.
23. NOT APPLICABLE. The reclamation process described above were integrated into the manufacturing process and were utilized to reclaim raw materials only.

24. Metal chloride impurities removed from the process were treated with lime to allow precipitation as metal hydroxide sludges. These sludges were collected from the clarifier, vacuum filters, and the bottom of the sedimentation ponds for off-site disposal. The only information available on this subject is from a wastewater treatment system process description included in a Concept Engineering Report prepared for Cabot Titania, Inc. and a contract between Koski Construction Company and Cabot Titania, Inc. for the disposal of waste material (metal hydroxide sludge).
25. The Titanium tetrachloride/Titanium dioxide production facility did not incinerate waste, nor did equipment exist for the incineration of waste while under the control of CTC, TCI, or CTI.
26. A review of existing contracts and other records reveals no information that Cabot Titania Corp., Titanium Chemical, Inc., or Cabot Titania Inc. had ever disposed of, or arranged for the disposal of, waste material in the Reserve Environmental Service, Inc. landfill.
27. Cabot has no information concerning whether leachate was observed escaping or being released from any storage or disposal areas on property owned or operated by CTC, TCI or CTI.
28. Cabot has no information indicating that leachate from any storage or disposal area on property owned or operated by Cabot was released or escaped to any surrounding ditches, Fields Brook, or a tributary thereof.
29. There is no indication that soil samples have been collected or monitoring wells installed within the referenced area to monitor for releases of pollutants or hazardous substances.
30. Cabot has no information concerning any location within the Fields Brook water basin at which waste from the production operations have been desposited. The metal hydroxide sludge generated from the treatment system was removed and disposed of off site.
31. The only source of information available concerning this topic is derived from a Concept Engineering Report prepared for Cabot Titania, Inc. Information within this report relevant to this question is a facility sketch attached as appendix A and the following specifications.

TiO<sub>2</sub> Clarification Ponds:

There were four 350,000 gallon capacity clarification ponds on the titanium dioxide production facility. Two of these ponds were connected in series and two connected in parallel. They were located west of the production facility and had a retention time of approximately 7 hours.

TiCl4 Clarification Lagoons:

There were two clarification ponds connected in series located on the titanium tetrachloride production facility. These were located adjacent to the clarifier.

Clarifier:

The clarifier was 20' x 80' x 10' deep, and rated to handle 685 gpsfd (gallons per square foot per day). Retention time was approximately 2.6 hours

Vacuum Filter:

Two vacuum filters, 10' dia. x 14', with a filter surface area of 440 sq. ft. each existed in the area around the clarifier. They had a rated handling capacity of 42,300 lbs/day.

32. The referenced facility did not receive hazardous substances for the purpose of treatment or disposal from any off site location while under the operation of CTC, TCI, or CTI. The reclamation processes described in answer #19 were incorporated into the production process to maximize utilization of raw materials and production efficiency.
33. NOT APPLICABLE (refer to answer #32).
34. Cabot has no information concerning off-site disposal facilities utilized by any operation under the control or ownership of CTC, TCI or CTI.
35. Cabot has no information regarding waste disposal methods utilized by any surrounding property owners or users.
36. Cabot has no information regarding contaminated fill material or debris deposited in or near Fields Brook or its tributaries other than that detailed in answer #9. This includes any information regarding fill allegedly disposed by Brenkus Excavating at or near the residence of Sandra Herl or any other location which may impact the Fields Brook drainage basin.
37. Information relevant to this question is still being collected and will be submitted in a supplemental Responce.