



Environmental
Protection Agency

Division of Materials and Waste Management

Response to Comments

**Project: Cytec Industries Inc. (Cytec), Director Initiated Permit Modification
Ohio EPA ID #: OHD 004 341 509**

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Ohio EPA held a public hearing on July 16, 2012, regarding a draft permit modification initiated by Ohio EPA on June 13, 2012, in order to authorize Cytec to implement corrective measures at their Marietta facility. This document summarizes the comments and questions received at the public hearing and during the associated comment period, which ended on July 28, 2012.

Ohio EPA reviewed and considered all comments received during the public comment period. By law, Ohio EPA has authority to consider specific issues related to protection of the environment and public health. Often, public concerns fall outside the scope of that authority. Ohio EPA may respond to those concerns in this document by identifying another government agency with more direct authority over the issue.

Responses to comments

Comment 1: Community members would like to see the North Landfill excavated and removed for the following reasons: health and safety of the community; limited life span of the slurry wall and landfill cap; long term liability; the cost of a future remedy; and future re-use of the site.

Response 1: Excavate and Remove the Waste in the Landfill: Ohio EPA determines appropriate remedies for waste management units (WMUs) based on site-specific considerations and the application of specific and established criteria. In the past, WMUs at Cytec were excavated because those units presented an immediate threat to the environment, such as directly leaking into Duck

Creek, or capping remedies were determined not to be effective or implementable at the site.

In some instances, these wastes were removed as a permanent and immediate measure to protect human health and the environment. For example, several feet of Pond 1 sludge was removed because the sludge could not be reliably capped due to its high moisture content. In addition, the sludge in Pond 1 was highly contaminated with chemicals, presenting a direct threat to the ground water and Duck Creek. In this case, Ohio EPA chose to have the sludge removed as a protective environmental remedy.

WMU 1 (North Landfill) was, on the other hand, used for disposal of industrial wastes such as dye filter cake, still bottoms, off-spec products, raw materials, and metal and fiber drums. Due to the absence of free liquids in the waste at the time of disposal, this unit does not present the acute, immediate threat like some other areas which were promptly excavated.

Due to additional fieldwork conducted in response to public comments, it was determined that lateral ground water flow through and immediately under the landfill is significant. Therefore, the remedy of leaving the waste in place, while augmenting the existing clay cap with a synthetic liner and additional clay, constructing a slurry wall intended to stop ground water flow through and under the landfill, enhancing the northeast corner of the landfill with a berm to provide additional barrier against floodwaters from Duck Creek, and a pump and treat system for contaminated ground water are a reasonable and protective remedy.

Ohio EPA considers several factors (criteria) when deciding on a certain remedy for a site. The first and foremost criterion is protection of human health and the environment. Other criteria take into account the following factors: whether the remedy can meet clean-up standards; compliance with environmental laws; controlling sources of contamination; reduction or elimination of future releases; long term reliability and effectiveness; reduction in toxicity, mobility or volume of waste; short term effectiveness; implementability; and cost. These criteria were developed to promote consistency in cleanups and were employed with previous decisions and cleanups made at Cytec.

Health and safety of the community: As stated above, the first and foremost criterion is protection of human health and the environment. In evaluating the preferred remedy and its ability to protect human health and the environment, the following factors were considered by Ohio EPA:

A fence which surrounds the perimeter of the site prevents unauthorized access to the site. The fence is inspected weekly by Cytec and maintained as needed. On a weekly basis the entire site, including the North Landfill, is inspected to determine integrity and any needed maintenance. The current soil/clay cap, with the addition of a plastic liner, and additional cover material with a vegetative cover will prevent direct contact with waste if any people access the site. A legally enforceable environmental covenant will be placed on the entire landfill that will prevent unauthorized digging, use of ground water for drinking or other purposes, or other unauthorized activity on the North Landfill. The planned ground water extraction system will prevent any migration of contamination off site. Contaminated ground water will be treated on site, if needed, and then discharged to the City of Marietta wastewater treatment plant for treatment and disposal.

As additional protective measures to safeguard the health of the community, the site will be inspected by Ohio EPA for integrity and for compliance with Cytec's hazardous waste permit/environmental rules and regulations on a quarterly basis or more frequently as needed. Ground water monitoring is conducted twice per year or more frequently, especially during the first year after the remedy has been completed.

Limited life span of the slurry wall and landfill cap: All "waste in place" closures, such as the slurry wall and landfill cap, require long term monitoring and maintenance. Therefore, frequent inspections and monitoring of the landfill cap will be conducted with the objective of identifying any failures. If detected, corrective action will be required to address the issue. The remedy is specifically designed to have several remedial components, which will provide overlapping protections, in case of a temporary failure of one component.

Long term liability and cost of a future remedy: OAC Rule 3745-54-101 requires financial assurance for Corrective Action facilities, such as this site. The slurry wall

will be specified in the permit and the permit will contain assurances of financial responsibility for completing the remedy and long term maintenance and any other corrective action needed in the future. This rule requires that the company must have adequate funds now and in the future to perform cleanup and monitoring specified in the permit. Also, Cytec's permit requires the company, and their successors, to properly maintain the site in the future. This legally enforceable document requires that if a new owner takes over the site, they would be held to the same strict standards for cleanup and monitoring as Cytec.

Future reuse of the site: Cytec is subject to state Corrective Action obligations through an Ohio EPA hazardous waste permit. The goal of Ohio EPA's Corrective Action permit is to require facilities, like Cytec, that have treated, stored or disposed of hazardous wastes (TSDs) to address environmental contaminants released into soil, ground water and surface water at their sites regardless of the time of the release. Cleanup and revitalization of properties contaminated with hazardous waste is a priority at Ohio EPA. Thus as Cytec successfully moves through the clean-up process, portions of the Cytec site will become eligible for industrial re-use. An example of this is Building 10. Re-use of this building is currently acceptable under the corrective action program, and may include other areas of the site. Areas of the site may be eligible for parking areas and vehicular traffic, pending Ohio EPA approval. Some areas of the site, such as the North Landfill, will have use restrictions as stated above. The use restrictions may include limiting soil excavation in areas where the presence of hazardous chemicals is known and/or prohibiting the drilling of water wells on site.

Comment 2: **Community members would like to see the Cytec site brought back to usable condition for future economic development in Marietta.**

Response 2: The goal of all Ohio EPA clean-up programs, including Resource Conservation and Recovery Act (RCRA) Corrective Action, is to return sites to reasonable re-use, as long as the protection of human health and the environment is maintained. Portions of the Cytec site will be usable under certain conditions in the future, while others will not. As Cytec successfully moves through the clean-up process, portions of the Cytec site will become eligible for industrial re-use. Examples of this are Building 10 and Pond 2. Re-

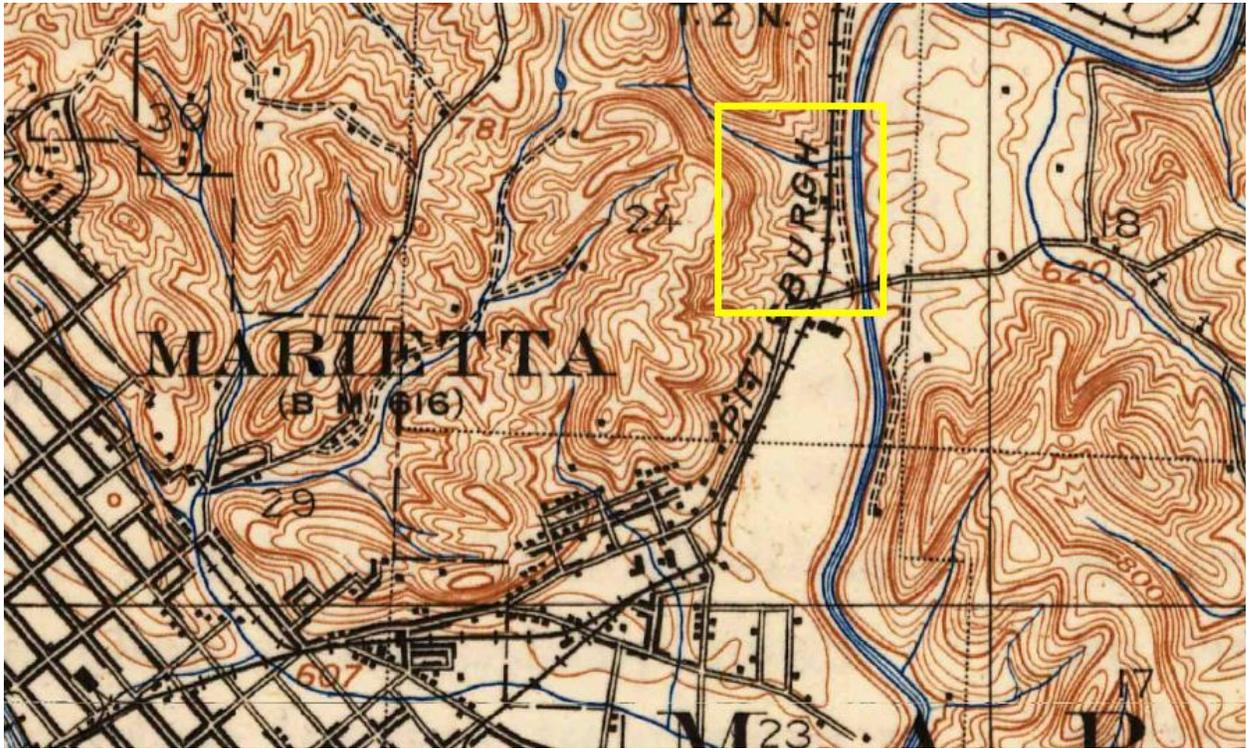
use of these areas are currently acceptable and may include other areas of the site. Some areas of the site will have use restrictions due to the presence of hazardous chemicals, such as the North Landfill. The use restrictions may include limiting soil excavation in areas where the presence of hazardous chemicals is known and/or prohibiting the drilling of water wells on site. Other examples of use restrictions include limitations on disturbing capped areas of the site. Sites that are in Ohio EPA's Brownfields program would have similar use restrictions in place.

Comment 3: Community members are concerned that water could infiltrate into the landfill from flood events on Duck Creek.

Response 3: Flood events in the Duck Creek Valley may occur which could impact the lower portions of the landfill; however, these events would be temporary (e.g. a few days) as waters would recede. In addition, a recompacted clay berm will be placed along the northeast corner of the landfill to prevent infiltration of waters from a 100-year flood event of Duck Creek.

Comment 4: Community members are concerned that Ohio EPA does not know the depth of the ravine which serves as the base of the North Landfill.

Response 4: According to a 1924 United States Geological Survey (USGS) Marietta, Ohio map, which is prior to the existence of the North Landfill, the bottom of the ravine was at an approximate elevation of 600 feet (see map below).



The full map can be viewed online at:

<http://epa.ohio.gov/dmwm/Home/HWIssuedActions.aspx>

Once on the Hazardous Waste Final Actions issued webpage click on the permits tab located towards the bottom of the page. The permits tab will list all of Ohio's permitted hazardous waste facilities. The Cytec map mentioned above can be found by selecting Cytec Industries Inc. from the list of facilities.

The current land surface at the top of the North Landfill is at 640 feet. Based on a geophysical study, including both seismic and electromagnetic testing of the site conducted by Cytec, as well as recent soil borings drilled into the landfill, the depth from ground surface to the bottom of the waste is approximately 45 feet. The seismic refraction survey conducted at the landfill concluded that the bottom clay/bedrock surface is 35 to 45 feet below surface. Based on this information, Ohio EPA does know the depth of the ravine and the extent of the waste in it.

Comment 5: Community members are concerned that contaminants from the landfill may be working their way towards the creek.

Response 5: A release has occurred from the landfill to the ground water, based on monitoring results. To address this, Ohio EPA is proposing a combination of the slurry wall, enhanced landfill cap, clay berm and ground water treatment system to prevent further migration of contaminants toward Duck Creek.

Comment 6: **The community is concerned that even with periodic monitoring, constituents could enter the environment undetected.**

Response 6: With implementation of the remedy, releases of waste constituents to ground water will be contained and ground water will be collected and treated prior to discharge. Ground water will be monitored a minimum of two times per year and includes an evaluation for several hundred chemicals. Therefore, it is not likely that any constituents could enter the environment undetected.

Comment 7: **The remedies selected by Ohio EPA are appropriate and Cytec agrees with them.**

Response 7: No response is necessary.

Comment 8: **Community members expect a timely and responsible cleanup.**

Response 8: Ohio EPA agrees with this comment.

Comment 9: **Community members are concerned that there are too many unknowns and long term questions about persistence and the activity of chemicals remaining at the Cytec site. One community member also asked what a half-life is of a chemical.**

Response 9: The ground water data from years of testing has shown consistent contaminants associated with historic landfill operations at the site. Monitoring wells were first installed in the mid-1980s and currently there are seven monitoring wells downgradient of the North Landfill. The following chemicals have been consistently detected in those monitoring wells: chlorobenzene, 1,2-dichlorobenzene, 1,2-dichloroethane, and nitrobenzene. Ohio EPA records indicate that dye filter cakes, still bottoms, off-spec products, raw materials, and metal and fiber drums were placed into the North Landfill from the 1940s until it was closed in 1979. The chemicals historically detected in the monitoring wells

are consistent with what would be expected for the dye filter cakes and still bottom waste. Chlorobenzene, 1,2-dichlorobenzene, and nitrobenzene are used in the manufacture of dyes and pigments and 1,2-dichloroethane is used as a solvent. Based on Ohio EPA experience with landfill ground water data, any unknown chemicals would most likely have been detected in the wells by now. There is currently 29 years of ground water monitoring data at the site and semiannual ground water monitoring, which looks for hundreds of different chemicals, will continue. Also, the concentrations of chlorobenzene, 1,2-dichlorobenzene, 1,2-dichloroethane, and nitrobenzene have shown a general downward trend since ground water sampling first began at the North Landfill.

In addition, numerous studies have been conducted at the landfill including geophysical surveys, test pits, soil borings, etc. which supports the information identifying the wastes historically disposed of in the landfill. All these studies conducted at the site and the monitoring results obtained are consistent with the records of what was disposed of in the landfill to justify the proposed clean-up measures. The remedy as proposed by Ohio EPA will address these concerns through the installation of a slurry wall to divert flow of ground water around the landfill, additional capping of the landfill to further minimize infiltration of water, and a ground water pump and treat system to extract contaminated ground water and treat it prior to discharge.

In determining the persistence of chemicals, we often refer to a chemical's half-life. This is the time required for a quantity to fall to half its value as measured at the beginning of the time period. In this context, a chemical's half-life represents the point at which 50% of that chemical has degraded.

Comment 10: **Community members expressed concern that Ohio EPA follow the original clean-up plan. As part of this original clean-up plan, one community member suggested that all hazardous wastes on site be removed and safely treated, including ground water and sediment from Duck Creek, and that the entire site should be returned to the original contours using clean fill.**

Response 10: There appears to be a misconception that Ohio EPA has veered away from an "original clean-up plan." This is a misunderstanding. Clean up of this site has been addressed

under established RCRA Corrective Action guidance since its initial stages. As WMUs have been investigated, appropriate remedies have been identified and implemented to protect human health and the environment. We believe this misunderstanding may have arisen because numerous excavations have previously been conducted at the site. These excavations were conducted at the site to address the most contaminated areas that posed the biggest concerns to human health and the environment. Some examples of this include the removal of wastes from Pond 1 and 2, the removal of waste from the old DDT production area, and demolition of contaminated buildings. These wastes were removed and taken off site because they presented a direct impact to Duck Creek and a continuing source of contamination to soil and ground water, and/or were areas that presented principal threats at the site. These areas contained wastes that were highly toxic, highly mobile and could not be readily contained by a cap.

The current clean-up plans proposed by Ohio EPA are for areas of the site where wastes and/or contamination remain that were not previously addressed during earlier clean-up phases or were not cleaned up to final standards. Ohio EPA has used the Final Remedy Selection for Results Based RCRA Corrective Action, U.S. EPA guidance for cleanups, as well as other Ohio EPA guidance and criteria in order to develop the clean-up plans. These criteria include: attainment of soil or ground water clean-up standards; compliance with environmental laws; controlling sources of contamination; reduction or elimination of future releases; long term reliability and effectiveness; reduction in toxicity, mobility or volume of waste; short term effectiveness; implementability; and cost. These criteria are consistent with previous decisions and cleanups made at Cytec.

In addition, Ohio EPA has used its 30 years of collective experience from remedies employed at other hazardous waste sites to make the decisions about Cytec's clean-up remedies. The remedies selected by Ohio EPA are protective of human health and the environment and maintain that protection over time. Ohio EPA considers the Cytec site a high priority, and will use a high degree of Agency involvement and oversight before, during and after the remedies have been completed. Ohio EPA also uses a team approach for the Cytec site, whereby multiple individuals with varying levels of technical expertise are involved and make decisions on the project.

Regarding the comment that all hazardous wastes should be removed from the site, Ohio EPA's goal is to achieve this objective whenever feasible. Wastes have been removed from the site as explained above, where feasible and Ohio EPA is proposing protective remedies for the remaining waste areas. However, there is no requirement under RCRA that all wastes be removed and sites be returned to unrestricted future uses; in the case of Cytec, the future use identified is continued industrial for the foreseeable future. Ohio EPA's clean-up goals are consistent with this future use of the site.

Comment 11: Community members expressed concern that we should think about people's lives before making a decision.

Response 11: Ohio EPA's agrees with this comment. The criteria under which we evaluate remedies takes into consideration exposures to contaminants, and how these exposures may negatively impact human health. This consideration is one of the most important criteria for overall protection of human health and the environment.

Comment 12: One community member indicated that Ohio EPA should talk to former Cytec employees about what was disposed of in the landfill.

Response 12: Ohio EPA has talked to Cytec employees about past operations at the site and disposal practices in general. This information has been useful and has helped us direct investigations and cleanups at the site.

Comment 13: One community member asked if there is a Superfund fund to completely clean up the site.

Response 13: Cytec is required, by their permit, to address clean-up at the facility under the RCRA Corrective Action Program. It is important to point out that both Superfund and RCRA Corrective Action programs are very similar and use similar criteria to evaluate and select remedial alternatives. Depending on certain site specific factors both Superfund and RCRA Corrective Action programs may either decide to clean-up a particular SWMU by removing the waste and disposing of it off site or by managing the waste on site so that it is protective of human health and the environment.

Comment 14: **One community member questioned with costs going up every year, if we find chemicals in 30 years, how much will it cost then?**

Response 14: Environmental monitoring has taken place at Cytec for over 30 years and Ohio EPA has relied on this information to make decisions about clean-up remedies at the site. With this amount of environmental data, the Agency is confident that we have identified the nature and extent of contamination at the site. Certainly, costs will rise in the future, however, the majority of remedies will have been completed by then, and the site will be in an operation and maintenance phase.

Comment 15: **One community member asked if any kind of soil mapping has been conducted because if there are barrels in the landfill, we don't know what is in them.**

Response 15: Numerous tests have been conducted at the landfill to determine the rate and extent of contamination at the landfill, including soil borings, test pits, geophysical surveys and cap integrity studies. The results of the geophysical surveys indicate that conductive waste materials such as metallic objects and/or filter cake, or brine/salt residues are present in the landfill. As previously indicated, records indicate that dye filter cake, still bottoms, off-spec products, raw materials, and metal and fiber drums were disposed of in the landfill. The studies and monitoring results support the disposal of these waste types in the landfill.

Comment 16: **One community member indicated that seismic activity could change the land, then water would start flowing.**

Response 16: Cytec conducts numerous tests at the site, including testing ground water monitoring wells two times a year for the presence of chemicals and to determine flow directions. If seismic activity would change the land such that ground water flow directions are altered, the testing that Cytec performs should detect the changes. Upon detection of a change in ground water flow; the issue would be assessed to determine what remediation activities would need to be taken to correct any problems caused by the seismic activity.

Comment 17: **One community member commented that water migrates off the Cytec property untreated, even when Duck Creek is frozen.**

Response 17: Ohio EPA is aware that liquid storm water migrates off the Cytec property, even during winter time when Duck Creek may be frozen over. Storm water runoff may consist of both storm water from the surrounding area, including I-77 and the East Norwood neighborhood, and seepage of ground water from the surrounding hillsides into the north ditch. All of this water is diverted to Duck Creek through the culverts under Hunter Avenue. Because the runoff is above freezing when it enters Duck Creek it will melt the ice on the creek in the immediate area of the discharge. In response to the same concern earlier by this citizen, Duck Creek was sampled in 2011 and did not reveal any site related contaminants in surface water.

Comment 18: **One community member expressed concern that a mist comes off the property which probably will burn leaves off the trees.**

Response 18: All of the field sampling conducted on the site since the facility ceased operation in the mid-1990's has never revealed a visible discharge of any air contaminants or that there are air emissions that would cause public health concerns or that could burn leaves off trees. Mist may be moisture in the air (fog) which settles into the Duck Creek valley. During site investigation and remediation activities, hand held chemical monitoring and clip-on personal air monitoring devices worn by site workers indicated that there were no excessive exposures to those workers.

Comment 19: **One community member expressed concern that large green above-ground pipes which were filled with concrete are being corroded by the contents of the pipes.**

Response 19: These pipes are part of a former sanitary sewer line that was used when the plant was in operation prior to the mid-1990's. The pipe was drained and cut in several places, filled with concrete, and is now corroding due to weathering. It does not drain to the city sewer.

Comment 20: **One community member indicated that recreational exposure to chemicals in Duck Creek and the Ohio River will have hazardous effects on the human body.**

Response 20: Duck Creek was sampled in 2011 and did not reveal any site related contaminants in surface water and therefore, no contamination of the Ohio River from Duck Creek could

occur. While concerns were identified that required remediation on site, the agency found no unacceptable risks in sediment or surface water to recreational users of Duck Creek. Future assessment of Duck Creek is planned with the goal of insuring that no unacceptable risks are present to any recreational users.

Ohio EPA Revision

Please note: May, 2012, Ohio EPA received and reviewed the Final Duck Creek Monitoring Report for the Cytec facility. This report included sediment, surface water, fish tissue sampling and biocriteria monitoring in Duck Creek on a biannual basis for years 2007, 2009, and 2011. The sampling was conducted to evaluate pesticide contamination (DDT and its metabolites) in Duck Creek and the effectiveness of the clean-up measures conducted at the site. The results showed decreasing sediment DDT concentrations and sediment DDT concentrations in the bioactive layer (0 to 6 inches below sediment surface) that are below site specific clean-up values. Fish tissue DDT concentrations were shown to be stable from 2007 through 2011.

Based on this information, Ohio EPA has determined that additional monitoring of Duck Creek is warranted. On August 3, 2012, Ohio EPA notified Cytec that continued sediment, surface water, fish tissue sampling and biocriteria monitoring be conducted on a 5 year schedule for the next 2 sampling events. The next sampling events will take place in 2016 and 2021, with the results being reported to Ohio EPA. The sampling will evaluate impacts to Duck Creek and ensure DDT concentrations adjacent to and below the site continue to decrease.

Permit Condition E.9(b)(xvi) has been revised to reflect this decision.

End of Response to Comments