IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF OHIO
WESTERN DIVISION

TIM LAGROU, *et al.*,	)	CASE NO.: 3:13-cv-00947-JGC
	)	
Plaintiffs,	)	Judge James G. Carr
vs.	)	
	)	Magistrate Judge James R. Knepp
WHIRLPOOL CORPORATION, *et al.*,	)	
	)	
	)	
Defendants.	)	

MEMORANDUM IN SUPPORT OF WHIRLPOOL CORPORATION'S MOTION TO DISMISS AMENDED COMPLAINT

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INTRODUCTION

Plaintiffs bring this putative class action lawsuit against Whirlpool Corporation ("Whirlpool"), Grist Mill Creek LLC ("GMC"), and John Does, for alleged personal injuries and property damage supposedly caused by "toxic chemical sludge" buried beneath a former recreational park Whirlpool owned until 2008 (the "Park") and at various unidentified, "undisclosed locations" around Clyde, Ohio. (Am. Compl. ¶¶ 27, 46, attached hereto as Ex. A.) Plaintiffs seek to hold Whirlpool liable for damage to property interests (Count One), continuing nuisance (Count Two), medical monitoring (Count Three), strict liability (Count Four), personal injury (Count Five), and wrongful death (Count Six). The Amended Complaint, however, contains virtually no factual allegations that support these claims, and it should be dismissed.

Plaintiffs' claims for personal injuries and a wrongful death fail because, among other reasons, they plead no facts showing that Whirlpool negligently or recklessly dumped chemicals at the Park or elsewhere in or near Clyde. (*Id.* ¶¶ 30-54.) Their personal injury claims also fail because Plaintiffs do not plead any facts showing that they actually were exposed to environmental toxins, much less specific "toxic manufacturing chemicals" produced by Whirlpool's operations. (*Id.* ¶¶ 1-27.) In fact, most Plaintiffs do not even claim that they visited the Park. (*Id.* ¶¶ 4-18.) None claim to have visited any other "undisclosed locations around Clyde" that supposedly contain "toxic waste materials." (*Id.* ¶ 46; *see also id.* ¶¶ 1-26.) Even for the small minority of Plaintiffs who claim they visited the Park, most do not allege any personal injury at all, and no Plaintiff alleges any facts showing how or when he or she personally was exposed to toxins. (*Id.* ¶¶ 2, 19-20, 22-26, 31-35.) Further, not a single Plaintiff alleges that his or her treating physicians or any state or federal regulatory agency attributed any illnesses or

health condition to environmental toxic exposures, to the Park, or to Whirlpool's operations that have been the economic heart of Clyde for more than 60 years. (*Id*. ¶¶ 1-48.)

With respect to Plaintiffs who claim property damage, no Plaintiff alleges any facts showing that any specific toxic chemicals were found on his or her property. (*Id.* ¶¶ 4, 16-17, 19, 22, 70-74.) Further, none of them alleges facts that would support "negligent, reckless, or intentional contamination" by Whirlpool, much less facts showing how or when the alleged underground toxic chemicals at the Park or other unidentified "contaminated sites" could possibly have been transported onto their own properties. (*Id.* ¶ 71.)

In short, the Amended Complaint simply alleges that (1) some Plaintiffs developed cancer or other illnesses during their lifetimes, and (2) that the U.S. Environmental Protection Agency ("U.S. EPA") found a presence of polychlorinated biphenyls ("PCBs") and other chemicals in the Park's subsurface soil. Plaintiffs then ask the Court to connect those two facts and find that Whirlpool is responsible for their personal injuries, a death, and property damages. Such speculative inferences are improper, especially where the Amended Complaint is barren of facts and where there are well-known facts that destroy such inferences—facts the Court can and should take judicial notice of.[1] *See Woods v. Willis*, No. 3:09CV2412, 2010 WL 3808279, at *7

[1] For example, it is well known that the lifetime risk of developing cancer is 41% for all U.S. residents, *see* National Cancer Institute, *SEER Cancer Statistics review 1975-2009*, available at http://seer.cancer.gov/csr/1975_2009_pops09/results_merged/topic_lifetime_risk_diagnosis.pdf, attached hereto as Ex. B, and that exposure to environmental pollutants accounts for just 2% of cancer deaths, *see* Ohio Dep't of Health, *Exposure to Toxic Chemicals and Cancer*, attached hereto as Ex. C. Moreover, Plaintiffs admit that the Ohio Department of Health ("ODH") and the Ohio Environmental Protection Agency ("Ohio EPA") studied 14 sites for potential environmental contamination in connection with the study of childhood cancer in Sandusky County, and "[n]o significant findings were made," including with respect to Whirlpool's sites. (Am. Compl. ¶ 41; *see* ODH et al., *Childhood Cancer among Residents of Eastern Sandusky County*, Oct. 30, 2009, attached as Ex. D (the "Ohio Report").) After studying the childhood cancer cases in the cluster, the ODH concluded that "[t]here were no exposures or variables that

n.7 (N.D. Ohio Sept. 27, 2010) (Carr, J.) (courts may consider public records and matters of which a court may take judicial notice on a 12(b)(6) motion). The Court should dismiss the Amended Complaint because Plaintiffs have pled no plausible factual basis for their claims.

RELEVANT BACKGROUND

I. STATEMENT OF ALLEGED FACTS

A. Whirlpool's Ownership, and Plaintiffs' Use, of the Park

Plaintiffs allege that Whirlpool owned and operated the Park for employees and members of the public from 1953 until 2008, at which time Whirlpool sold the Park to GMC. (Am. Compl. ¶¶ 27, 31, 44.) During its heyday, the Park was "widely used by generations of citizens of Clyde, Green Springs, and Sandusky County for its recreational opportunities," including "a picnic shelter, an in-ground outdoor pool, basketball court, tennis court, volleyball court, creek, pond, and other outdoor recreational amenities." (*Id.* ¶¶ 32-33.) The pool was filled with water from Grist Mill Creek, which flows through the Park from South to North. (*Id.* ¶ 35.)

Plaintiffs are 22 adults who live in Sandusky County, Fulton County, or Wood County, Ohio. (*Id.* ¶¶ 1-26.) Among Plaintiffs, however, only Tim Lagrou (on behalf of decedent Christina Lagrou), Mark Gill, Gail Gill, Melanie Gill, Mariah Strayer, Sam Strayer, Adysan Gill, and Abigail Gill allege that they visited or lived near the Park. (*Id.* ¶¶ 1-2, 19-20, 22-26.) None of the remaining 14 Plaintiffs allege that they ever visited or used the Park. (*Id.* ¶¶ 3-18, 21.)

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were common to the 21 children with cancer who participated in this profile." Sandusky County Health Department & ODH, *Childhood Cancer in Eastern Sandusky County, 1996-2010: A Profile of 21 Cases*, May 26, 2011, at 4, attached as Ex. E. Given the substantial lifetime risk of developing cancer, and given the findings of the regulatory agencies that have studied childhood cancer incidence in Sandusky County, Plaintiffs cannot simply allege, "I have cancer" or "I have some other medical condition," and ask the court to infer that Whirlpool is therefore responsible.

B. The Childhood Cancer Cluster in Sandusky County

Plaintiffs allege that, beginning in the winter of 2005, the Sandusky County Health Department ("SCHD") received telephone calls regarding a large number of childhood and young adult cancer cases in Sandusky County. (Am. Compl. ¶ 36.) The telephone calls led the SCHD and the ODH to conduct an investigation, beginning in June 2006, into the number of cancer cases. (*Id*. ¶ 37.) That investigation revealed a higher number of childhood cancer cases than expected, as well as a higher number of brain and central nervous system cancers than expected, in a distinct geographic area. (*Id*. ¶ 38.) That led to a follow-up investigation, which allegedly showed clustering of childhood and young adult cancers of multiple types in the northeastern portion of Sandusky County extending into southeastern Ottawa County and northwestern Erie County, with a radius of 7.25 miles. (*Id*. ¶ 39.)

Due to these findings, in March 2008 the Ohio EPA started environmental monitoring in Clyde. (*Id*. ¶ 40.) On October 30, 2009, the Ohio EPA and ODH identified 14 sites for environmental investigation in its Ohio Report. (*Id.* ¶ 41.) The Amended Complaint concedes that "[n]o significant findings were made." (*Id*.)

Coinciding with this Ohio EPA investigation, the ODH and the U.S. EPA established a telephone hotline for individuals to inform the U.S. EPA of potential dumpsites in the area. (*Id*. ¶ 41.) Through this hotline, the U.S. EPA received a report that Whirlpool had filled in the area surrounding and under the basketball court in the Park with "black sludge-like material." (*Id*. ¶ 42.) The U.S. EPA subsequently conducted a site assessment and issued a report entitled "Site Assessment Report for the Whirlpool Park Site Green Springs, Sandusky County, Ohio" (the "EPA Report"). (*Id*.) The EPA Report concluded that some of the soil underneath the Park contained PCBs and total metals at levels exceeding the U.S. EPA's regional screening levels for residential properties and exceeding the U.S. EPA's requirements for PCB spill cleanup. (*Id*. ¶ 43

(emphasis added because the Park was not a residential property).) The assessment revealed a "9.5-foot layer of mottled gray and black sludge fill material with a petroleum odor" under 0.5 feet of top soil. (*Id*.) Plaintiffs do not allege that U.S. EPA, or anyone else, concluded that Park visitors were exposed directly to PCBs or metals, much less that anyone ingested those materials and became ill as a result. (*Id.* ¶¶ 36-43.)

Based on these less-than-sparse factual allegations, Plaintiffs conclude that Whirlpool "dumped" toxic chemicals at the Park. (*Id*. ¶¶ 47, 77.) Plaintiffs further allege that Whirlpool "dumped and disposed of toxic waste materials from its manufacturing facility in Clyde, Sandusky County, Ohio into the ground and water in undisclosed locations around Clyde, Ohio and within the Cancer Cluster geographic region." (*Id*. ¶ 46.) Plaintiffs do not provide any facts at all regarding the "undisclosed" sites. (*Id.* ¶¶ 1-119.) They also plead no facts to contradict the conclusions of the Ohio EPA and ODH. (*Id.* ¶¶ 41-43.)

C. Plaintiffs' Alleged Injuries

Plaintiffs allege that Christina Lagrou ("Ms. Lagrou") used the Park from her birth in 1983 until she died in 2006 from large cell lymphoma "as a result of exposure to" the "toxic manufacturing chemicals which defendants dumped" at the Park. (Am. Compl. ¶ 2.) Plaintiffs do not allege any facts that, if true, would show that Ms. Lagrou actually was exposed to PCBs or metals under the basketball court at the Park (*e.g.*, how she physically came into contact with or ingested any underground chemicals). Plaintiffs further allege that Ms. Lagrou exposed her minor child, Hayden Lagrou, to PCBs or other chemicals *in utero*, but offer no details as to how this might have occurred. (*Id.* ¶¶ 2, 3.) Hayden Lagrou does not claim personal injury. (*Id.* ¶ 3.)

Along with Hayden Lagrou, Plaintiffs Sarah Requena, Mark Gill, Gail Gill, Austin Gill, Ashtyn Gill, Melanie Gill, McKenna Strayer, Hudson Strayer, Mariah Strayer, Sam Strayer, Adysan Gill, and Abigail Gill do not allege any personal injury. (*Id*. ¶¶ 6, 19-20, 22-26.)

Although each of these individuals, except Ms. Requena, alleges that he or she used the Park for recreational purposes and have lived within 1500 feet of the Park, none alleges any facts showing how they were exposed to underground chemicals at the Park or the "undisclosed" sites. (*Id*.)

Plaintiffs Connie Patrick, Ryan Patrick, Connor J. Requena, Brandon Weiker, Thomas F. Mathers Jr., Sandra Sage, Aaron Sage, Robbin Krotzer, Tina Metzger, Angela Metzger, Brandon Zienta, Emmagene Hackenburg, Diane Caldwell, and Jason Caldwell allege they have contracted at least seven different types of cancer (large cell lymphoma, leukemia, non-Hodgkin's lymphoma, throat cancer, breast cancer, cervical cancer, foot cancer) and suffer from various other ailments (including diabetes, fibromyalgia, and unspecified illnesses related to their thyroid, immune, and neurological systems). (*Id*. ¶¶ 4-18.) Plaintiffs refer to these individuals as the "Personal Injury Plaintiffs." (*Id*. ¶ 101.) Each Personal Injury Plaintiff baldly alleges, with no well-pled facts, that he or she contracted the illness "as a result of exposure to toxic manufacturing chemicals which defendants dumped or distributed at Whirlpool Park or other locations in and around Clyde, Ohio." (*Id*. ¶¶ 2, 4-18, 21.) None claims to have visited the Park or "undisclosed" sites, and none alleges facts showing personal exposures to toxic chemicals. (*Id*.) Plaintiffs Connor J. Requena and Thomas F. Mathers Jr. do not even allege that they live or lived within the "cancer cluster" region. (*See id*. ¶¶ 6-7, 9.)

Plaintiffs Connie Patrick, Emmagene Hackenburg, Diane Caldwell, Mark Gill, and Melanie Gill further allege that their "property has been damaged by defendants." (*Id*. ¶¶ 4, 16-17, 71.) Plaintiffs refer to these individuals as the "Representative Property Plaintiffs." (*Id*. ¶ 71.) Although they allege that the "toxic chemicals" have "escaped" from the Park (*id*. ¶ 78), Plaintiffs do not allege that they have discovered any chemicals on their properties, much less explain how or why the chemicals derived from the Park (*i.e.*, what chemicals were found, where

they were found, the basis for alleging that the materials escaped from the Park or the "undisclosed" sites, etc.). Plaintiffs baldly allege that their properties have lost value because they are "in the immediate vicinity of the contaminated sites, downstream from said sites, and within the cancer cluster geographic region." (*Id.* ¶ 71.)

II. PROCEDURAL HISTORY

On March 28, 2013, Plaintiffs filed this action in the Court of Common Pleas for Sandusky County, Ohio. They served the Complaint on Whirlpool the following day via certified mail. On April 26, 2013, at approximately 12:00 p.m., Whirlpool removed this action to this Court pursuant to the Class Action Fairness Act. Shortly before filing the removal papers, counsel for Whirlpool checked the Common Pleas docket to confirm that they had all process, pleadings, and orders that needed to be included with the removal papers. Having confirmed that there were no new filings, Whirlpool filed its notice of removal and attached Plaintiffs' original complaint and the other process and pleadings that had been served. At 12:30 p.m., Whirlpool emailed Plaintiffs' counsel a courtesy copy of the removal papers.

At 4:22 p.m. on April 26, after Whirlpool had filed its removal papers in both this Court and the Common Pleas court, the receptionist at Albrechta & Coble (Plaintiffs' law firm) emailed Whirlpool's counsel and forwarded a copy of Plaintiffs' Amended Complaint, which Plaintiffs had filed on April 25, but which the Common Pleas clerk's office had not yet served or docketed. Because Plaintiffs had not served Whirlpool with a copy of the Amended Complaint before Whirlpool removed the case to this Court, Whirlpool's removal was proper even though it did not include a copy of the Amended Complaint. *See* 28 U.S.C. § 1446(a) (requiring attachment of all pleadings which have been "served" in the state court proceedings); *Miami Valley Hosp. v. Cmty. Ins. Co.*, No. 3:05-cv-297, 2006 WL 2252669, at *9 (S.D. Ohio Aug. 7, 2006) (rejecting argument that the notice of removal was defective because it did not include a

copy of an amended complaint that had not been served on the defendant prior to removal). Although Plaintiffs have not yet filed their Amended Complaint in this Court, Whirlpool believes that Plaintiffs intend for the Amended Complaint to be the operative complaint going forward. Thus, Whirlpool's motion addresses the allegations in Plaintiffs' Amended Complaint.

ARGUMENT

I. STANDARD OF REVIEW

Dismissal of a complaint pursuant to Rule 12(b)(6) is proper where the complaint does not "contain either direct or inferential allegations respecting all the material elements to sustain a recovery under some viable legal theory." *Mezibov v. Allen*, 411 F.3d 712, 716 (6th Cir. 2005). Under Rule 8(a), a "plaintiff's obligation to provide the 'grounds' of his 'entitle[ment] to relief' requires more than labels and conclusions, and a formulaic recitation of the elements of a cause of action will not do." *Bell Atl. Corp. v. Twombly*, 550 U.S. 544, 555 (2007) (alteration in original). The complaint must set forth "sufficient factual matter, accepted as true, to 'state a claim to relief that is plausible on its face.'" *Ashcroft v. Iqbal*, 556 U.S. 662, 678 (2009) (quoting *Twombly*, 550 U.S. at 570). That standard "asks for more than a sheer possibility that a defendant has acted unlawfully" and requires more than facts that are merely consistent with liability. *Id.* Although the Court must presume all well-pled factual allegations are true, that "tenet . . . is inapplicable to legal conclusions." *Id.*; *see New Albany Tractor, Inc. v. Louisville Tractor, Inc.*, 650 F.3d 1046, 1050 (6th Cir. 2011) ("[C]ourts may no longer accept conclusory legal allegations that do not include specific facts necessary to establish the cause of action.").

II. THE LAGROUS AND PERSONAL INJURY PLAINTIFFS FAIL TO STATE NEGLIGENCE CLAIMS FOR WRONGFUL DEATH AND PERSONAL INJURY[2]

A plaintiff asserting personal injury or wrongful death claims premised upon negligence must allege (1) the existence of a legal duty, (2) that the defendant breached that duty, and (3) that the breach of duty proximately caused injury to the plaintiff or decedent's death. *E.g.*, *Littleton v. Good Samaritan Hosp. & Health Ctr.*, 529 N.E.2d 449, 454 (Ohio 1988); *Kerner v. Terminix Int'l Co.*, No. 2:04-CV-735, 2008 WL 163609, at *4 (S.D. Ohio Jan. 17, 2008). The Amended Complaint fails to allege facts necessary to support the second and third elements.

A. Plaintiffs Fail to Allege Facts Showing Whirlpool Breached a Duty

Plaintiffs must allege facts that, if true, show Whirlpool breached a duty it owed to Plaintiffs. *See Uddin v. Embassy Suites Hotel*, 848 N.E.2d 519, 522 (Ohio Ct. App. 2005). Here, at a minimum, Plaintiffs must allege facts showing that Whirlpool dumped PCBs or toxic materials at the Park. Plaintiffs have not done even that. Although they assert a conclusory allegation that Whirlpool "dump[ed] toxic materials at Whirlpool Park" (Am. Compl. ¶ 47), they plead no facts regarding the alleged "dumping." (*Id*. ¶¶ 42, 47, 77.) These allegations are nothing more than rumor, innuendo, and unwarranted inferences masquerading as "facts," and they should not be accepted as true. *See Sharp v. Ingham Cnty.*, 23 F. App'x 496, 498 (6th Cir. 2001) ("The court is not, however, bound to accept as true unwarranted factual inferences or legal conclusions unsupported by well-pleaded facts." (citations omitted)).

For instance, Plaintiffs misrepresent the EPA Report to manufacture the alleged breach of

[2] Plaintiffs allege that their injuries were caused by "defendants' intentional, reckless, or negligent" actions. (Am. Compl. ¶¶ 102-04, 117.) Because "[t]he elements of a personal injury claim vary depending upon the nature of the claim," *Maddox v. L.O. Warner, Inc.*, No. 15468, 1996 WL 50152, at *5 (Ohio Ct. App. Feb. 7, 1996), Plaintiffs' "personal injury" and "wrongful death" claims must be analyzed under theories of both negligence and intentional tort.

duty. Specifically, Plaintiffs allege that the U.S. EPA reported that "at some time during Whirlpool's ownership of the property, dumping of a toxic chemical sludge which included [PCBs] occurred at Whirlpool Park." (Am. Compl. ¶ 27 (emphasis added).) That "fact" does not appear anywhere in the EPA Report. (*See* EPA Report at 1-6, attached hereto as Ex. F.) The Court should consider as part of Plaintiffs' pleading the EPA Report because the Report is "referred to in [Plaintiffs'] complaint" and is "central to the claims"—indeed, the Report forms the entire alleged factual basis for Plaintiffs' claims that Whirlpool breached a duty and that Whirlpool's conduct caused their injuries. *See Whittiker v. Deutsche Bank Nat'l Trust Co.*, 605 F. Supp. 2d 914, 924 (N.D. Ohio 2009). Accordingly, Plaintiffs' conclusory "dumping" allegation can and should be ignored.[3] *See Davis v. World Sav. Bank, FSB*, 806 F. Supp. 2d 159, 172 (D.D.C. 2011) ("[W]hen the bare allegations of the complaint conflict with any exhibits or documents, whether attached or adopted by reference, the exhibits or documents prevail.").

Although Plaintiffs correctly point out that the U.S. EPA found some PCBs underground at the Park, they leap to the unwarranted conclusion that Whirlpool is responsible for "dumping" those PCBs. But, again, the EPA Report contains no such finding. (Ex. F at 1-6.) This is precisely the type of conclusory allegation and inference that the Supreme Court and Sixth Circuit have determined are insufficient to withstand a motion to dismiss. *See, e.g.*, *Sharp*, 23 F. App'x at 499 ("It is not enough for a complaint to contain mere conclusory allegations of [wrongful conduct]. Some factual basis for such claims must be set forth in the pleadings."); *Lewis v. ACB Bus. Servs., Inc.*, 135 F.3d 389, 407 (6th Cir. 1998) (upholding dismissal where the

[3] In any event, Plaintiffs' allegation that "dumping" occurred does not suggest Whirlpool is the party responsible for it, as Plaintiffs themselves point to the conduct of not-yet-identified parties whom Plaintiffs believe are responsible for "dumping." (Am. Compl. ¶¶ 51-52.)

plaintiff's "attempts at showing a retaliatory motive . . . amount[ed] to nothing more than unwarranted factual inferences and legal conclusions that are insufficient to state a claim").

B. Plaintiffs Fail to Plead Facts Supporting Their Speculation that Whirlpool's Alleged Breach of Duty Proximately Caused Their Injuries

To state a "prima facie case involving an injury caused by exposure to . . . [a] toxic substance, a claimant must establish (1) that the toxin is capable of causing the medical condition or ailment (general causation), and (2) that the toxic substance in fact caused the claimant's medical condition (specific causation)." *Terry v. Caputo*, 875 N.E.2d 72, 77 (Ohio 2007);[4] *see also Pluck v. BP Oil Pipeline Co*., 640 F.3d 671, 676–77 (6th Cir. 2011) ("In a toxic-tort case, as here, the plaintiff must establish both general and specific causation through proof that the toxic substance is capable of causing, and did cause, the plaintiff's alleged injury."). Plaintiffs do not sufficiently plead facts in support of the causation element of their negligence claim.

1. Plaintiffs fail to allege that PCBs or other (unnamed) chemicals found at the Park are generally capable of causing their alleged injuries

Plaintiffs rely solely on the existence of PCBs and other unidentified "materials" beneath the Park (and at other unspecified locations) to plead causation. But "it is well-settled that the mere existence of a toxin in the environment is insufficient to establish causation without proof that the level of exposure could cause the plaintiff's symptoms." *Pluck*, 640 F.3d at 679. Without additional factual allegations, Plaintiffs' reliance on the mere existence of PCBs underground at the Park and the generic allegations that PCBs are "hazardous," "toxic," and "a known carcinogen" are insufficient to plead general causation. (Am. Compl. ¶¶ 87, 89.)

[4] The *Terry* court discussed the requirements for stating a personal injury claim based on exposure to a toxic substance in the context of a motion for summary judgment. Here, although the Court is not examining evidence as it would on a motion for summary judgment, *Terry* is still instructive as Plaintiffs have not adequately pled facts in support of the elements of their claim.

Critically, Plaintiffs fail to link the PCBs to specific diseases; instead, they conclusorily allege only that unspecified "high levels of PCBs, metals, and other toxic chemicals" increase a person's risk of "contracting one or more serious and life-threatening or life-ending diseases." (*Id*. ¶ 89; *see also id*. ¶¶ 101-02). According to Plaintiffs, the PCBs or other unidentified "materials" caused unrelated cases of large cell lymphoma, leukemia, non-Hodgkin's lymphoma, throat cancer, breast cancer, cervical cancer, foot cancer, diabetes, and fibromyalgia, as well as other unspecified developmental, reproductive, thyroid, immune system, and neurological conditions. (*Id*. ¶¶ 2, 4-18, 21, 101.) But Plaintiffs fail to allege any facts showing that PCBs are capable of causing each such illness or unnamed condition.

Plaintiffs also fail to identify the concentrations at which PCBs present clinically significant health risks, much less that each Plaintiff personally was exposed to PCBs at such concentrations. These omissions are particularly glaring because the EPA Report contains a detailed account of the varying concentrations of substances found at the Park (Ex. F at Table 1), but Plaintiffs do not even attempt to allege—because they cannot do so in good faith—that these concentrations are sufficient to cause each of their illnesses or conditions. *See Scheid v. Fanny Farmer Candy Shops, Inc.*, 859 F.2d 434, 437 (6th Cir. 1988) ("[W]hen a complaint omits facts that, if they existed, would clearly dominate the case, it seems fair to assume that those facts do not exist." (quoting *O'Brien v. DiGrazia*, 544 F.2d 543, 546 n.3 (1st Cir. 1976))).

2. Plaintiffs fail to allege facts showing that Whirlpool's alleged breach of duty specifically caused their injuries

Specific causation requires a plaintiff to "show that he was exposed to the toxic substance and that the level of exposure was sufficient to induce the complained-of medical condition." *Valentine v. PPG Indus., Inc.*, 821 N.E.2d 580, 588 n.1 (Ohio Ct. App. 2004), *aff'd sub nom.*

Valentine v. Conrad, 850 N.E.2d 683 (Ohio 2006); *accord Pluck*, 640 F.3d at 677. The Amended Complaint falls well short of pleading facts that support this requirement.

Plaintiffs' only causation allegations are conclusions. Each Personal Injury Plaintiff alleges only that he or she "has contracted" cancer or "suffered" an illness "as a result of [his or her] exposure to toxic manufacturing chemicals which defendants dumped or distributed at Whirlpool Park or other locations in or around Clyde, Ohio." (Am. Compl. ¶¶ 4-5, 7-18.) They categorically allege that "[a]s a direct and proximate result of defendants' intentional, reckless, or negligent handling and disposal of toxic and hazardous chemicals, including PCB's, Personal Injury Plaintiffs were caused personal injury." (*Id*. ¶ 102.) Similarly, Plaintiffs generically plead that Ms. Lagrou died "as a result of exposure to toxic manufacturing chemicals which defendants dumped at Whirlpool Park" (*id*. ¶ 2) and that her "death was caused by defendants' intentional, reckless, or negligent handling and disposal of toxic and hazardous chemicals, including PCBs" (*id*. ¶ 117). Those allegations are insufficient. *See In re Heparin*, MDL No. 1953, 2010 WL 547322, at *2-3 (N.D. Ohio Feb. 9, 2010) (Carr, J.).

In *In re Heparin*, for instance, this Court dismissed a wrongful death claim where the plaintiff referred "vaguely to failures to comply with federal requirements, hemolysis, and Gambro's Class II recall," but did not allege that those failings (kinked tubing) were the cause of the plaintiff's injuries. *Id.*at 2. Rather, the plaintiff "summarily state[d] that decedent's injuries and death resulted '[a]s a direct and proximate result' of Gambro's actions." *Id*. at *2 (alteration in original). This Court determined that the plaintiff's allegations were "no more than 'formulaic recitation of the elements of a cause action,'" which are "insufficient to survive a motion to dismiss." *Id*. at *3 (quoting *Twombly*, 550 U.S. at 555).

Similarly here, Plaintiffs simply allege there are PCBs and toxic materials at the Park and at other undisclosed locations in Clyde, and then summarily conclude they were injured by those chemicals. But Plaintiffs fail to plead any facts showing that they have been exposed to underground PCBs, much less that their levels of exposure were sufficient to cause their cancers and other health conditions. (*See* Am. Compl. ¶¶ 4-5, 7-19 (concluding only that they were "expos[ed]" to PCBs and other unspecified chemicals).) In fact, no Personal Injury Plaintiff alleges he or she visited the Park, much less that he or she came into contact with PCBs buried beneath it. Nor do Plaintiffs allege that any of them came into contact with PCBs or other toxins buried beneath any other unnamed site. And Plaintiffs do not allege any facts showing that PCBs beneath the Park contaminated their drinking water, because there are no such facts.

Plaintiffs do allege that Ms. Lagrou used the Park "since she was born in 1983," was raised within 1500 feet of the Park, and that her mother used the Park while she was pregnant with Ms. Lagrou. (*Id*. ¶ 2.) But these allegations, without more, are insufficient to plead exposure. To the contrary, the EPA Report concluded that the levels of PCBs exceeding the EPA's PCB cleanup requirements were found well below ground level—at six to eight feet at one site and 10 to 12 feet at another site. (Ex. F at Figure 4.) The other four samples that were taken closer to the surface were well below the EPA's cleanup requirements.[5] (*Id*.) But Plaintiffs do not allege how Ms. Lagrou came into contact with PCBs located underneath the Park or how the levels of PCBs found at or near the surface caused any clinically significant health risk.

Plaintiffs also imply (but do not actually allege) that they were exposed to the "toxic" chemicals through swimming in or drinking contaminated water. (Am. Compl. ¶ 35 ("The pool

[5] The EPA applied a 50 mg/kg requirement for PCB cleanups. The levels of PCBs found at 0.5 to six feet below the ground, however, ranged from 0.25 to 3.7 mg/kg. (*See* Ex. F at Figure 4.)

at Whirlpool Park was filled using water from Grist Mill Creek which flows north past the basketball courts and toxic sludge dump site . . . ."); *id.* ¶ 46 (Whirlpool "dumped and disposed of toxic waste materials . . . into the ground and water in undisclosed locations").) But no Plaintiff alleges that PCBs were transported from the ground into the Park's pool or that he or she swam in the pool while it contained PCBs. And Plaintiffs' inference about drinking water is directly contradicted by the Ohio Report referenced in the Amended Complaint. (*Id.* ¶ 41.) That report explained that the Ohio EPA found no "carcinogenic health concerns" in water samples taken from the cancer cluster geographic region:

> Drinking water sampling was conducted in January and February of 2009. Eleven drinking water samples were collected from two public water systems and domestic water wells. The samples were analyzed for a broad scan of carcinogenic and noncarcinogenic chemical compounds. Results of the sampling did not identify any components of drinking water that suggest carcinogenic health concerns. Additional sampling of drinking water was conducted in June 2009. . . . Samples were obtained from public water systems, domestic wells, reservoirs and a river intake. The analytical results are consistent with the previous drinking water quality results with the detection of low level concentrations of commonly used pesticides in water which is derived from a stream or reservoir. No results from a treated drinking water sample exceeded a maximum contaminant health level standard.

(Ex. D at 26 (emphasis added).) Thus, Plaintiffs' speculation that PCBs made their way into the Park's pool, the region's waterways, and the potable water supply should be ignored.

Because the Amended Complaint fails to allege any facts showing that Ms. Lagrou and the Personal Injury Plaintiffs were exposed to any PCBs or that any PCB exposures caused their illnesses, the Court should not make these unsupported inferential leaps. *See, e.g.*, *Pinares v. United Technologies Corp.*, No. 10-80883-CIV, 2011 WL 240522, at *4 (S.D. Fla. Jan. 19, 2011) (dismissing personal injury claim where the plaintiffs only alleged that they developed cancer "as a direct and proximate result of [Defendant's] release of hazardous materials" but did "not allege that any contaminant touched their property" and did "not provide any factual basis

for the allegation that Defendant is responsible for Plaintiff's cancer" (alteration in original)); *In re Heparin*, 2010 WL 547322, at *3 (dismissing claims where the "[p]laintiff never specifically alleges that decedent's dialysis machine had kinked tubing, nor ties the possible result of kinked tubing—hemolysis—to decedent's actual cause of death"); *Townsend v. Williger*, No. 5:05-CV-02540, 2006 WL 721394, at *4 (N.D. Ohio Mar. 16, 2006) ("The fact that [decedent's] death certificate lists his cause of death as dehydration does not, without more, lead to the inference that [defendant] negligently caused his dehydration or failed to properly care for his condition.").

Accordingly, the negligence claims in Counts Five and Six should be dismissed.

III. PLAINTIFFS FAIL TO STATE INTENTIONAL TORT CLAIMS FOR PERSONAL INJURY OR WRONGFUL DEATH

An "intentional tort claim" means "a claim alleging that a tortfeasor intentionally caused or intentionally contributed to the injury or loss to person . . . or that a tortfeasor knew or believed that the injury or loss to person or property or the wrongful death was substantially certain to result from the tortfeasor's conduct." Ohio Rev. Code Ann. § 2307.011(D). The Amended Complaint does not come close to alleging that type of tortious conduct because there are no well-pled facts suggesting Whirlpool (or anyone else for that matter) performed any act intending to cause Plaintiffs' harm or knowing that injury was substantially certain to result from its conduct. Indeed, Plaintiffs fail to plead facts showing (a) when the PCBs were dumped at the Park or at any other site; (b) that Whirlpool intended to dump PCBs or other unnamed "materials" at the Park; (c) that Whirlpool knew back in the 1950s that PCBs could or would cause injury or death; (d) that Whirlpool knew, at the time it transported or buried the PCBs or other unnamed "materials," that those materials were capable of causing death or injury but did it anyway; (e) that Whirlpool intended to cause any of the Personal Injury Plaintiffs' injuries or Ms. Lagrou's death; and (f) that the "materials" caused the Personal Injury Plaintiffs' injuries or

Ms. Lagrou's death. Without more, Plaintiffs have not pled personal injury or wrongful death claim based on intentional or reckless conduct, and Counts Five and Six should be dismissed.

IV. PLAINTIFFS' MEDICAL MONITORING "CLAIM" SHOULD BE DISMISSED

A. Ohio Does Not Recognize a Medical Monitoring Cause of Action

"Ohio law recognizes medical monitoring as a form of damages for an underlying tort," not as an independent cause of action. *Mann v. CSX Transp., Inc.*, No. 1:07-cv-3512, 2009 WL 3766056, at *3 (N.D. Ohio Nov. 10, 2009), *aff'd sub nom. Hirsch v. CSX Transp., Inc.*, 656 F.3d 359 (6th Cir. 2011); *see also First Prop. Grp., Ltd. v. Behr Dayton Thermal Prods. LLC*, No. 3:08-cv-329, 2011 WL 4073851, at *6 (S.D. Ohio Sept. 13, 2011) (granting motion to dismiss medical monitoring claim "without prejudice to Plaintiffs' ability to seek medical monitoring as a remedy"); *In re Telectronics Pacing Sys., Inc.*, 168 F.R.D. 203, 216 (S.D. Ohio 1996) ("[M]edical monitoring is . . . an element of damages rather than an independent cause of action under . . . Ohio . . . law."); *Day v. NLO*, 851 F. Supp. 869, 879-80 (S.D. Ohio 1994) ("Recognition that a defendant's conduct has created the need for future medical monitoring does not create a new tort. It is simply a compensable item of damage when liability is established under traditional tort theories of recovery." (citation omitted)). Plaintiffs' "claim" (Count Three) should be dismissed because it is not an independent cause of action.

B. Plaintiffs Have Not Pled the Elements Necessary to Obtain a Medical Monitoring Remedy under Ohio Law

A plaintiff can obtain medical monitoring only if she pleads and proves all elements of an underlying tort, including general and specific causation. *Mann*, 2009 WL 3766056, at *3. Because Plaintiffs fail to state a claim under any cognizable theory (*see* Argument, Parts II-III, *supra*; Argument, Parts V-VIII, *infra*), they are not entitled to the remedy of medical monitoring.

Moreover, simple exposure to a disease-causing chemical is insufficient to obtain medical monitoring, and the Sixth Circuit has explicitly recognized that "[n]ot every increased risk of disease warrants increased medical scrutiny." *Hirsch*, 656 F.3d at 363. To obtain such a remedy, a plaintiff must plead and prove (1) that the toxin is a "known cause[] of human disease" and (2) that the plaintiff was exposed to the toxin "in an amount sufficient to cause a significantly increased risk of disease such that a reasonable physician would order medical monitoring." *Mann*, 2009 WL 3766056, at *3. Plaintiffs have not done this in their Amended Complaint.

Here, Plaintiffs identify only one alleged carcinogen by name—PCBs—and then conclude that the presence of "high levels of PCBs, metals, and other toxic chemicals" at the Park increased Plaintiffs' "risk of contracting one or more serious and life-threatening or life-ending diseases." (Am. Compl. ¶ 89.) The only specific factual allegations that even arguably suggest a link between PCBs and disease are Plaintiffs' allegations that the U.S. EPA lists PCBs among the top 10% of most toxic chemicals (*id.* ¶ 87) and that the U.S. EPA found that PCBs at the Park exceeded U.S. EPA standards (*id.* ¶ 86). The U.S. EPA's findings alone, however, cannot be used to support Plaintiffs' claim. *See Mann*, 2009 WL 3766056, at *5 (rejecting the plaintiffs' attempt to rely on the U.S. EPA soil cleanup level as a basis for justifying medical monitoring; "the EPA soil cleanup level represents a threshold for the cleanup of contaminated soil, not a danger point above which individuals require medical monitoring").

Further, Plaintiffs do not allege any facts showing that they were exposed to PCBs in an amount sufficient to cause a significantly increased risk of disease. (*See* Argument, Part II.B, *supra*.) As noted above, most Plaintiffs do not even allege that they visited the Park. (Am. Compl. ¶¶ 3-18, 21.) And the fact that certain Plaintiffs visited the Park or lived in the vicinity of the Park cannot support their conclusion that they were exposed to PCBs in an amount justifying

medical monitoring. *See Mann*, 2009 WL 3766056, at *4 ("Mere residence in the impact zone is insufficient evidence of contamination and increased risk because it ignores any individual variables, most notably, at what level the named Plaintiffs were actually exposed to dioxins.").

Finally, Plaintiffs fail to plead that, given their alleged PCB exposures, "a reasonable physician would order medical monitoring for them," *Hirsch*, 656 F.3d at 363, much less that any physician has ordered medical monitoring for them. Thus, Count Three should be dismissed.

V. THE REPRESENTATIVE PROPERTY PLAINTIFFS FAIL TO STATE A CLAIM FOR DAMAGE TO PROPERTY INTERESTS

The Representative Property Plaintiffs allege that their real estate has been "significantly damaged" because their properties are "in the immediate vicinity of the contaminated sites, down-stream from said sites, and within the cancer cluster geographic region." (Am. Compl. ¶ 71.) They further allege that "[t]he contamination, known health effects, and fear which typically result from high levels of PCBs and other toxic chemicals have decreased plaintiffs' property values." (*Id.* ¶ 72.) These allegations, which amount to some variety of environmental stigma, are insufficient to state a claim under Ohio law.

First, there is no standalone cause of action for "damage to property interest" in Ohio. To the extent that Plaintiffs intend to assert negligence, nuisance, or strict liability claims, with "lost property value" being the measure of damages, those claims fail because Plaintiffs have not adequately pled any of those claims. (Argument, Parts II-III, *supra*; *id.*, Part VII, *infra*.)

Second, Ohio does not recognize "lost property value" as a recoverable measure of damages when the basis for the alleged diminution is environmental stigma. In Ohio, "pure environmental stigma, defined as when the value of real property decreases due solely to public perception or fear of contamination from a neighboring property, does not constitute compensable damages." *Ramirez v. Akzo Nobel Coatings, Inc.*, 791 N.E.2d 1031, 1034 (Ohio Ct.

App. 2005); *see also Chance v. BP Chems., Inc.*, 670 N.E.2d 985, 993 (Ohio 1996) (rejecting argument that the "trial court should have allowed appellants to present evidence that environmental stigma associated with the deepwells had a negative effect on appellants' property values due to the public perception that there may have been injectate under appellants' properties and that the injectate may be dangerous"). Here, Plaintiffs seek to recover damages because their properties are "in the immediate vicinity" of the Park or other unidentified "sites" and have allegedly lost value due to the "[t]he contamination, known health effects, and fear which typically result from high levels of PCBs and other toxic chemicals." (Am. Compl. ¶¶ 71-72.) These are stigma damages, which are not available in Ohio. *See Younglove Constr., LLC v. PSD Dev., LLC*, 782 F. Supp. 2d 457, 462 (N.D. Ohio 2011) (Carr, J.) ("Ohio courts have denied recovery for stigma damages representing a decrease in property value 'due solely to public perception or fear,' and have required that a plaintiff 'must show actual harm.'" (quoting *Ramirez*, 791 N.E.2d at 1034)); *cf. Pinares*, 2011 WL 240522, at *4 ("Plaintiffs cannot state a claim for concerns based on media stories. Plaintiffs do not allege that they have suffered diminution in value of their property because of contamination. Rather, they base their alleged damages on media reports that allegedly caused a drop in property values.").

Although Plaintiffs conclusorily allege in Count Two—their continuing nuisance claim, not their property damage claim—that "[t]he toxic chemicals have escaped from Whirlpool Park to the lands and property of the Representative Property Plaintiffs" (Am. Compl. ¶ 78), they fail to plead any facts suggesting that their properties have actually suffered any physical damage. For instance, they make no allegation showing that they tested their property for contamination, no allegation showing that they discovered PCBs on their properties, and no allegation showing how PCBs have physically affected their properties. This dearth of facts is fatal. *See, e.g.*,

Coppola v. Smith, No. 1:11–cv–1257, 2013 WL 1281591, at *5 (E.D. Cal. Mar. 26, 2013) (dismissing CERCLA claim where plaintiff failed to specify when and what toxic substances entered plaintiff's property); *Thunander v. Uponor, Inc.*, 887 F. Supp. 2d 850, 871 (D. Minn. 2012) (dismissing claims where the complaint was "devoid of any allegations demonstrating that Plaintiffs [had] tested their water to support their assertion of contamination"); *Pinares*, 2011 WL 240522, at *2 (dismissing property damage claims where the plaintiff merely concluded that contaminants had invaded their property but there was "no indication in the complaint that Plaintiffs have tested their property and found any contamination from any source").

VI. THE REPRESENTATIVE PROPERTY PLAINTIFFS FAIL TO PLEAD A CONTINUING NUISANCE CLAIM

A. Plaintiffs Do Not Allege a Continuing Nuisance

Ohio law recognizes two types of nuisances: permanent or continuing. *Ashtabula River Corp. Grp. II v. Conrail, Inc.*, 549 F. Supp. 2d 981, 984 (N.D. Ohio 2008). "A continuing nuisance arises when the wrongdoer's tortious conduct is ongoing, perpetually generating new violations. Conversely, a permanent nuisance occurs when the wrongdoer's tortious act has been completed, but the plaintiff continues to experience injury in the absence of any further activity by the defendant." *Kramer v. Angel's Path, L.L.C.*, 882 N.E.2d 46, 52 (Ohio Ct. App. 2007) (citations omitted). "[I]t is ongoing tortious conduct, and not merely recurring injury, that gives rise to a continuing nuisance or continuing trespass claim." *Yeager v. Carpenter*, No. 14-09-19, 2010 WL 3081441, at *6 (Ohio Ct. App. Aug. 9, 2010). "When determining whether a defendant has committed a continuing trespass, this Court may not consider whether the damage[] is ongoing or persists, rather, the Court must examine whether some ongoing tortious activity may be attributed to Defendant." *Lally v. BP Prods. N. Am., Inc.*, 615 F. Supp. 2d 654, 660 (N.D. Ohio 2009) (citing *Sexton v. City of Mason*, 883 N.E.2d 1013, 1018 (Ohio 2008)).

Lally is instructive here. The *Lally* plaintiff bought two parcels of land that previously had been owned by the Standard Oil Company. In 1993, years after Standard Oil sold the properties, the plaintiff discovered the presence of contaminants resulting from the release of petroleum. *Id*. at 657. The plaintiffs alleged that the ongoing contamination and failure to remediate constituted "ongoing tortious conduct." *Id*. at 661. The court disagreed, finding that the sale in 1965 meant that all tortious conduct had ceased by that date. *Id*. The court further found that the alleged failure to remediate was not an "ongoing tortious act" because the basis of the nuisance claim was the contamination, not the failure to remediate, and because the plaintiffs failed to show that Ohio law recognizes a duty to remediate. *Id*. at 662 ("[T]he Court has not been apprised of any duty to remediate at common law."); *see also Ashtabula River Corp.*, 549 F. Supp. 2d at 985 (rejecting the plaintiff's argument that the nuisance was continuing where the complaint did not "refer to any recent polluting activities"); *Weir v. E. Ohio Gas Co*., No. 01 CA 207, 2003 WL 1194080, at *7 (Ohio Ct. App. Mar. 12, 2003) ("[W]e find the 1989 leak was a single act which deposited contaminants on Appellants' property, the effects of which, and not the conduct of East Ohio was continuous and therefore a permanent trespass or nuisance.").

The same analysis applies here. In this case, the Representative Property Plaintiffs bring a claim for "continuing nuisance." (Am. Compl. at 20-22.) To that end, they conclude that "[s]ince 1953 the defendants created and maintained a nuisance on the property known as Whirlpool Park and other sites," which allegedly "continues to this day." (*Id.* ¶ 76.) The nuisance is allegedly caused by Whirlpool's "creat[ion] [of] toxic chemicals which were dumped at Whirlpool Park and other sites in the cancer cluster geographic region" (*id*. ¶ 77) and then "escaped from Whirlpool Park to the lands and property of the Representative Property Plaintiffs" (*id*. ¶ 78). Plaintiffs fail to allege, however, that the "dumping" or "escape" to their property occurred

repeatedly or even on more than one occasion. And Plaintiffs admit that Whirlpool sold the Park property to GMC in 2008, at which time any alleged dumping must have ceased. (*Id*. ¶¶ 27-28, 31.) Because the Amended Complaint contains no facts showing that "dumping" or "escaping" is continual, Plaintiffs have not pled a continuing nuisance claim.

B. Plaintiffs Fail to Sufficiently Allege a Permanent Nuisance Claim

Even assuming that the Representative Property Plaintiffs intended to plead their "Continuing Nuisance" claim as a permanent nuisance claim, the permanent nuisance claim also fails as a matter of law. Under Ohio law, a "nuisance" is defined as "the wrongful invasion of a legal right or interest." *Kramer*, 882 N.E.2d at 51 (2007) (quoting *Taylor v. Cincinnati*, 55 N.E.2d 724, 727 (Ohio 1944)). It is "a distinct tort, consisting of anything wrongfully done or permitted that unreasonably interferes with another in the enjoyment of his property." *Natale v. Everflow E., Inc.*, 959 N.E.2d 602, 607 (Ohio Ct. App. 2011). For a nuisance to be actionable, "the invasion must be either (a) intentional and unreasonable or (b) unintentional but caused by negligent, reckless, or abnormally dangerous conduct." *Kramer*, 882 N.E.2d at 52. Plaintiffs also must plead that their injuries were proximately caused by Whirlpool's conduct. *See Uland v. S.E. Johnson Cos.*, No. WM-97-005, 1998 WL 123086, at *5 (Ohio Ct. App. Mar. 13, 1998).

1. Plaintiffs fail to sufficiently plead an "invasion" of their legal interests

To state a claim for nuisance, a plaintiff must plead that there was an "invasion" of their property. *See Kramer*, 882 N.E.2d at 51. Plaintiffs provide a single allegation in support of this element: "[t]he toxic chemicals have escaped from Whirlpool Park to the lands and property of the Representative Property Plaintiffs." (Am. Compl. ¶ 78.) But Plaintiffs provide no facts from which this Court can infer that any PCBs or other "materials" at the Park (or at any other site) in

fact escaped from the Park and was transported to Plaintiffs' properties.[6] For instance, they do not allege that they have discovered (via testing or otherwise) any chemicals on their properties, what contaminants they have discovered, or how those contaminants escaped from the Park to their properties (such that the Court can infer that the chemicals came from the Park as opposed to any other site in Northern Ohio). Although Plaintiffs need not plead every fact regarding the alleged invasion, they must do more than merely conclude that it occurred.[7] *See, e.g.*, *Pinares*, 2011 WL 240522, at *4 ("A nuisance claim must allege contamination of the plaintiff's property. . . . Plaintiffs allege that their property was 'invaded' 'as set forth above,' but there are no allegations 'above' (or below), of any invasion of their property." (citation omitted)).

2. Plaintiffs fail to plead Whirlpool intended to cause Plaintiffs' injuries

Ohio law divides nuisance into two categories based on the level of the actor's culpability. "An absolute nuisance is based on either intentional conduct or an abnormally dangerous condition that cannot be maintained without injury to property, no matter what care is taken," while a "qualified nuisance is essentially a tort of negligent maintenance of a condition that creates an unreasonable risk of harm, ultimately resulting in injury." *State ex rel. R.T.G., Inc. v. State*, 780 N.E.2d 998, 1010 (Ohio 2002). "To recover damages for a qualified nuisance, negligence must be averred and proven." *Kramer*, 882 N.E.2d at 53.

Here, Plaintiffs conclusorily allege that "Defendants intended to cause the formation of these toxic chemicals and that the defendants intended the chemicals to escape to the lands of the

[6] Neither the EPA Report nor the Ohio Report state that any chemical has escaped from the Park. (*Compare* Am. Compl. ¶ 78, *with* Exs. D & F.)

[7] Plaintiffs' allegations with respect to the other "dump" sites are even more deficient. Although Plaintiffs conclude that Whirlpool "created and maintained a nuisance on the property known as Whirlpool Park and other sites," (Am. Compl. ¶ 76 (emphasis added)), they fail to allege that any chemicals "escaped" from these "other sites" to their properties (*id.* ¶ 78).

Representative Property Plaintiffs." (Am. Compl. ¶ 79; *see also id.* ¶ 83 ("Defendants' intentional or reckless handling and disposal of toxic and hazardous chemicals, including PCBs, was conducted willfully, wantonly, and maliciously . . . .").) Because Plaintiffs do not allege negligent maintenance, their nuisance claim is necessarily one for absolute nuisance. Plaintiffs fail, however, to allege any facts showing that Whirlpool intended for the PCBs and other "materials" to escape to the Representative Property Plaintiffs' properties. As shown above, Plaintiffs do not even allege facts that, if true, would show that Whirlpool was the party responsible for burying PCBs or other "materials" at the Park, that Whirlpool knew that PCBs had been buried in the Park, or that the PCBs had "escaped" to certain Plaintiffs' properties. In short, the Amended Complaint falls well short of alleging intentional conduct by Whirlpool.

3. Plaintiffs fail to allege the "toxic chemicals" caused Plaintiffs' injuries

To maintain an action for nuisance, "the injury must be real, material, and substantial." *Banford v. Aldrich Chem. Co.*, 932 N.E.2d 313, 317 (Ohio 2010). "Damages for nuisance may include diminution in the value of the property, costs of repairs, loss of use of the property, and compensation for annoyance, discomfort, and inconvenience." *Id*. The damages must be "connected to the person's loss of use or loss of enjoyment of property." *Id* at 319. Moreover, "in order to recover damages for annoyance and discomfort in a nuisance claim, a plaintiff must establish that the nuisance caused physical discomfort," *i.e.*, affected one or more of the plaintiff's senses. *Id*. at 318-19. "[F]ear and emotional harm alone are insufficient" nuisance injuries without allegations of physical discomfort. *Id*. at 319-20.

Here, the Representative Property Plaintiffs allege that they experienced "annoyance, discomfort, and inconvenience" and "emotional distress" (Am. Compl. ¶ 82(c)), but they fail to allege any facts showing they suffered physical discomfort <u>connected to the loss of use or enjoyment of their property</u>. *See Banford,* 932 N.E.2d at 317. For example, Plaintiffs Mark Gill

and Melanie Gill do not allege that they suffered any physical harm whatsoever. They do not claim that PCBs on their property affected their "sight, sound, smell, hearing, or touch." *Id*. at 318; *see also id*. at 319 ("In cases in which courts have determined that circumstances did not rise to the level of nuisance and refused to award damages for annoyance and discomfort, the offending situation had no effect on the senses and thus no physical component of annoyance and discomfort."). In fact, they claim that they had no idea their property was contaminated until they read the EPA Report. (*See* Am. Compl. ¶ 54.)

Although Plaintiffs Connie Patrick, Emmagene Hackenberg, and Diane Caldwell allege that they suffered physical harm (*id*. ¶¶ 4, 16-17), they fail to allege any facts showing that their alleged illnesses were caused by the nuisance and "related to the use" of their property. To the contrary, Plaintiffs provide only the conclusory allegation that Plaintiffs Patrick's, Hackenberg's, and Caldwell's illnesses were a "result of her exposure to toxic manufacturing chemicals which defendants dumped or distributed at Whirlpool Park." (*Id*.) The Amended Complaint likewise contains no well-pled facts showing that the chemicals escaped from the Park onto their property or that their medical problems were caused by exposure to PCBs or unnamed "materials" that exist onto their own property. *See, e.g.*, *Thunander*, 887 F. Supp. 2d at 871.

Further, Plaintiffs' alleged injury in the form of "cleanup costs" is insufficient because they do not plead facts showing that they have actually incurred costs to remediate their property or even that they will need to remediate in the future. (Am. Compl. ¶¶ 75-84.) Nor have they alleged facts showing that the alleged nuisance (*i.e.*, the existence of PCBs or other "materials" on their own land) has decreased their properties' values. (*Id.*) Indeed, the only "fact" alleged regarding the alleged diminution in value is that the diminution was caused by their property

being in "the immediate vicinity of the contaminated sites." (*Id.* ¶ 71.) Because Plaintiffs fail to sufficiently allege injury as a result of the alleged nuisance, Count Two should be dismissed.

VII. PLAINTIFFS FAIL TO PLEAD A STRICT LIABILITY CLAIM

A. Plaintiffs Have Not Pled Facts Sufficient to State a Strict Liability Claim

To state a strict liability claim under Ohio law, Plaintiffs must plead that Whirlpool "carries on an abnormally dangerous activity" and that Plaintiffs suffered "harm . . . resulting from the activity." Restatement (Second) of Torts § 519 (1977); *see Hurier v. Ohio Dep't of Transp.*, No. 01AP-1362, 2002 WL 2005755, at *3 (Ohio Ct. App. Sept. 3, 2002) (strict liability attaches when "one is using one's land or property for activities, which are unreasonably hazardous"). Plaintiffs have not pled any facts sufficient to hold Whirlpool strictly liable.

First, Plaintiffs have not pled facts suggesting that Whirlpool carried on an abnormally dangerous activity. "Absolute liability attaches only to ultrahazardous or abnormally dangerous *activities* and not ultrahazardous or abnormally dangerous *materials*." *Splendorio v. Bilray Demolition Co.*, 682 A.2d 461, 465-66 (R.I. 1996) (emphasis in original). Plaintiffs allege that "PCBs and the other toxic chemicals found at Whirlpool Park are abnormally dangerous." (Am. Compl. ¶ 95.) But whether PCBs and the other chemicals are "abnormally dangerous," "toxic," or "poisonous" is irrelevant. *See, e.g.*, *Splendorio*, 682 A.2d at 465-66 (holding that although asbestos is "understandably an ultrahazardous or abnormally dangerous material," strict liability does not attach merely because asbestos or another dangerous substance is involved).

Plaintiffs' allegations that Whirlpool's "production and use [of PCBs and other chemicals] in manufacturing" and "[m]aintaining, storing, and disposing of PCBs and other toxic chemicals" were "abnormally dangerous activities" are insufficient. (*Id.* ¶¶ 95-96). When determining whether an activity is abnormally dangerous, courts consider the following factors:

> (a) existence of a high degree of risk of some harm to the person, land or chattels of others; (b) likelihood that the harm that results from it will be great; (c) inability to eliminate the risk by the exercise of reasonable care; (d) extent to which the activity is not a matter of common usage; (e) inappropriateness of the activity to the place where it is carried on; and (f) extent to which its value to the community is outweighed by its dangerous attributes.

Restatement (Second) of Torts § 520 (1977); *see Abraham v. BP Exploration & Oil, Inc.*, 778 N.E.2d 48, 53-54 (Ohio Ct. App. 2002). "For many courts, the analysis of whether an activity is abnormally dangerous revolves around factor (c), whether the activity can be made safe through the exercise of reasonable care." *Fletcher v. Conoco Pipe Line Co.*, 129 F. Supp. 2d 1255, 1261 (W.D. Mo. 2001); *cf. R.T.G., Inc.*, 780 N.E.2d at 1010 (affirming that coal mining is not an absolute nuisance "because it can be conducted safely when care is taken"); *Splendorio*, 682 A.2d at 466 ("[A]n activity is not abnormally dangerous if the risks therefrom could be limited by the exercise of reasonable care." (alteration in original) (citation omitted)).

Here, the Amended Complaint not only fails to address whether any of Whirlpool's alleged activities could be made safe through the exercise of reasonable care, but also fails to address any of the Restatement's other factors. Although Plaintiffs need not plead and prove each Restatement factor to establish the existence of an abnormally dangerous activity, they must allege more than the legal conclusion that the alleged activity is "abnormally dangerous." *See, e.g., Bd. of Cnty. Comm'rs v. Brown Grp. Retail, Inc.*, 598 F. Supp. 2d 1185, 1196 (D. Colo. 2009) (dismissing strict liability claim for abnormally dangerous activities because the plaintiffs failed to allege specific facts relevant to the Restatement factors); *Ganton Techs., Inc. v. Quadion Corp.*, 834 F. Supp. 1018, 1020 (N.D. Ill. 1993) (granting motion to dismiss strict liability claim and stating "the PCB clean-up activities are not abnormally dangerous. There is no basis for believing any risk of harm could not be eliminated by the use of reasonable care.").

Second, Plaintiffs fail to sufficiently allege "harm . . . resulting from" Whirlpool's alleged abnormally dangerous activities. Restatement § 519. Instead, Plaintiffs merely conclude that their "personal and property interests" were damaged "[a]s a direct and proximate result of defendants' activities." (Am. Compl. ¶ 98.) But Plaintiffs Hayden Lagrou, Sarah Requena, Mark Gill, Gail Gill, Austin Gill, Ashtyn Gill, Melanie Gill, McKenna Strayer, Hudson Strayer, Mariah Strayer, Sam Strayer, Adysan Gill, and Abigail Gill do not allege that they have been injured in any way. (*See id*. ¶¶ 3, 6, 19-20, 22-26.) And the remaining Plaintiffs merely conclude, without any supporting facts, that their injuries were the "result of" exposure to PCBs or other "materials" that Whirlpool allegedly buried in the Park and at other sites. (*Id*. ¶¶ 2, 4-5, 7-18, 21.) These allegations are insufficient as a matter of law. *See, e.g.*, *In re Heparin*, 2010 WL 547322, at *2-3 (summarily alleging that injuries and death were "a direct and proximate result" of the defendant's actions "is insufficient to survive a motion to dismiss").

In short, because Plaintiffs fail to allege facts suggesting that Whirlpool engaged in any "abnormally dangerous activity" or that Whirlpool's alleged activities proximately caused their alleged harm, their claim for strict liability (Count Four) fails as a matter of law.

B. Plaintiffs' Strict Liability Claim Is Subsumed by Their Nuisance Claim and Should Be Dismissed for the Same Reasons

"A claim for ultrahazardous activity is analytically identical to that of absolute nuisance." *Oros v. Hull & Assocs., Inc.*, 302 F. Supp. 2d 839, 848 (N.D. Ohio 2004) (internal quotation marks omitted); *see also Chance v. BP Chems., Inc.*, Nos. 66622, 66645, & 67369, 1995 WL 143827, at *7 (Ohio Ct. App. Mar. 30, 1995); Restatement (Second) of Torts § 520, cmt. c (1977) ("The rule of strict liability [for abnormally dangerous activities] frequently is applied by many courts . . . under the name of 'absolute nuisance.'"). Because Plaintiffs' nuisance claim requires them to establish liability based on an absolute nuisance, their strict

liability claim should be dismissed as redundant, and for the same reasons as their nuisance claim. *See, e.g.*, *Neville v. City of Wyo.*, No. C-020064, 2002 WL 31094766, at *3 (Ohio Ct. App. 2002) ("We hold th[e] [strict liability] claim to be subsumed within the portion of the absolute-nuisance claim involving inherently hazardous activities. Having found the absolute-nuisance claim to be without merit, we also hold that summary judgment was proper on the strict-liability claim.").

CONCLUSION

For all these reasons, the Court should dismiss Plaintiffs' Amended Complaint.

Dated: May 3, 2013

Respectfully submitted,

s/Kip T. Bollin

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Attorneys for Defendant Whirlpool Corporation

CERTIFICATE OF SERVICE

I hereby certify that, on this 3rd day of May, 2013, a copy of the foregoing document entitled **Memorandum in Support of Whirlpool Corporation's Motion to Dismiss Amended Complaint** was filed electronically with the District Court. Notice of this filing will be sent to counsel for all parties by operation of the Court's electronic filing system.

s/Kip T. Bollin
Attorneys for Defendant,
Whirlpool Corporation

IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF OHIO
WESTERN DIVISION

TIM LAGROU, *et al.*,	)	CASE NO.: 3:13-cv-00947-JGC
	)	
Plaintiffs,	)	Judge James G. Carr
vs.	)	
	)	Magistrate Judge James R. Knepp
WHIRLPOOL CORPORATION, *et al.*,	)	
	)	
	)	
Defendants.	)	

DEFENDANT WHIRLPOOL CORPORATION'S
MOTION TO DISMISS PLAINTIFFS' AMENDED COMPLAINT

Pursuant to Federal Rules of Civil Procedure 8(a) and 12(b)(6), Defendant Whirlpool Corporation ("Whirlpool") moves for an order dismissing every Count asserted in Plaintiffs Tim Lagrou, Connie Patrick, Ryan Patrick, Sarah Requena, Brandon Weiker, Thomas F. Mathers Jr., Sandra Sage, Aaron Sage, Robbin Krotzer, Tina Metzger, Angela Metzger, Brandon Zienta, Emmagene Hackenburg, Diane Caldwell, Jason Caldwell, Mark Gill, Gail Gill, Melanie Gill, Mariah Strayer, Sam Strayer, Adysan Gill, and Abigail Gill's (collectively, "Plaintiffs") Amended Complaint, Including Class Action Claims Pursuant to Civ. R. 23, With Jury Demand Endorsed Hereon ("Amended Complaint"), for the following reasons:

1. On March 28, 2013, Plaintiffs filed this action in the Court of Common Pleas for Sandusky County, Ohio. They served the Complaint on Whirlpool the following day via certified mail. On April 26, 2013, Whirlpool removed this action to this Court pursuant to the Class Action Fairness Act and included all documents that had been filed in the Common Pleas court

and served on Whirlpool. After Whirlpool emailed Plaintiffs' counsel a courtesy copy of the removal papers on April 26, Plaintiffs' counsel served Whirlpool's counsel by email with a copy of the Amended Complaint, which Plaintiffs had filed on April 25 but had not served on Whirlpool until Whirlpool had removed the action to this Court. The Common Pleas court also had not docketed the Amended Complaint as of the close of that court's business on April 26. Although Plaintiffs have not yet filed their Amended Complaint in this Court, Whirlpool believes that Plaintiffs intend for the Amended Complaint to be the operative complaint going forward. Thus, this motion addresses the allegations in Plaintiffs' Amended Complaint.

2. The First Claim (Damages to Property Interests) in the Amended Complaint fails because there is no standalone claim for "damage to property interest" in Ohio and because Plaintiffs' claim is based on the alleged environmental stigma of being in close proximity to Whirlpool Park and other unidentified, "undisclosed" sites, but Ohio law does not permit recovery of stigma damages.

3. The Second Claim (Continuing Nuisance – Cleanup) fails because Plaintiffs do not allege any ongoing tortious acts by Whirlpool and because Plaintiffs fail to sufficiently plead an "invasion" of their properties, that Whirlpool intended to cause Plaintiffs' injuries, or that any alleged chemicals on their properties caused their injuries.

4. The Third Claim (Medical Monitoring) fails because medical monitoring is not an independent cause of action under Ohio law. The claim also fails because Plaintiffs have not alleged that polychlorinated biphenyls ("PCBs") are a known cause of diseases, that Plaintiffs were each exposed to PCBs in an amount sufficient to cause a significantly increased risk of diseases, or that a reasonable physician would order or has ordered medical monitoring for them.

5. The Fourth Claim (Strict Liability) fails because Plaintiffs do not allege facts showing that Whirlpool carried on any abnormally dangerous activity or that Plaintiffs suffered harm as a result of such activity. The strict liability claim also fails because it is subsumed by Plaintiffs' deficiently pled nuisance claim.

6. The Fifth Claim (Personal Injury) fails because Plaintiffs do not sufficiently allege that Whirlpool breached any duty owed to Plaintiffs or that Whirlpool's alleged breach proximately caused Plaintiffs' injuries. To the extent Plaintiffs seek to bring this claim for intentional conduct in addition to negligence, the intentional "personal injury" claim also fails because Plaintiffs do not plead facts showing that Whirlpool acted intentionally or intended to cause Plaintiffs' injuries.

7. The Sixth Claim (Wrongful Death) fails because Plaintiffs do not sufficiently allege that Whirlpool breached any duty owed to decedent Christina Lagrou or that Whirlpool's alleged breach proximately caused Ms. Lagrou's death. To the extent Plaintiffs seek to bring this claim for intentional conduct in addition to negligence, the intentional wrongful death claim also fails because Plaintiffs do not plead facts showing that Whirlpool acted intentionally or intended to cause Ms. Lagrou's death.

In support of this motion, Whirlpool has concurrently filed a memorandum of law.

For all these reasons and those stated in the concurrently filed memorandum of law, Whirlpool requests that the Court dismiss with prejudice the First, Second, Third, Fourth, Fifth, and Sixth Claims asserted in Plaintiffs' Amended Complaint.

Dated: May 3, 2013

Respectfully submitted,

s/Kip T. Bollin

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Attorneys for Defendant Whirlpool Corporation

CERTIFICATE OF SERVICE (CM/ECF)

I hereby certify that on May 3, 2013, a copy of the foregoing **Defendant Whirlpool Corporation's Motion to Dismiss Plaintiffs' Amended Complaint** was filed electronically. Notice of this filing will be sent by operation of the Court's electronic filing system to all parties indicated on the electronic filing receipt. All other parties will be served by regular U.S. Mail. Parties may access this filing through the Court's system.

s/Kip T. Bollin
Kip T. Bollin
Attorneys for Defendant,
Whirlpool Corporation

EXHIBIT A

IN THE COURT OF COMMON PLEAS
OF SANDUSKY COUNTY, OHIO

TIM LAGROU, Administrator,
Estate of Christina Lagrou, and as
parent and next friend of
HAYDEN LAGROU, a minor
2143 Croghan Street
Fremont, Ohio 43420,

and

CONNIE PATRICK
310 West McPherson Highway
Clyde, Ohio 43410,

and

RYAN PATRICK
303 North Woodland Avenue
Clyde, Ohio 43410,

and

SARAH REQUENA, as
parent and next friend of
CONNOR J. REQUENA, a minor
300 Woodpointe Drive
Woodville, Ohio 43469,

and

BRANDON WEIKER
1704 Buckland Avenue
Fremont, Ohio 43420,

and

) Case No. 13CV306

) Judge John P. Dewey

) **AMENDED COMPLAINT, INCLUDING CLASS ACTION CLAIMS PURSUANT TO CIV. R. 23, WITH JURY DEMAND ENDORSED HEREON**

THOMAS F. MATHERS JR.)
203 Monroe Street
Delta, Ohio 43515,)

and)

SANDRA SAGE)
1124 Whittlesey St.
Fremont, Ohio 43420,)

and)

AARON SAGE)
1124 Whittlesey St.
Fremont, Ohio 43420,)

and)

ROBBIN KROTZER)
11214 Whittlesey St.
Fremont, Ohio 43420,)

and)

TINA METZGER)
3440 Tiffin Road
Fremont, Ohio 43420,)

and)

ANGELA METZGER)
1310 Liberty Street
Fremont, Ohio 43420,)

and)

BRANDON ZIENTA)
1501 Birchard Avenue, Apartment B
Fremont, Ohio 43420,)

and)

EMMAGENE HACKENBURG)
5830 CR 175
Clyde, Ohio 43410,)

and)

DIANE CALDWELL)
2451 CR 185
Clyde, Ohio 43410,)

and)

JASON CALDWELL)
2451 CR 185
Clyde, Ohio 43410,)

and)

MARK GILL, Individually and as parent and next friend of AUSTIN GILL, ASHTYN GILL, and ALEX GILL, minors)
1750 County Road 181
Green Springs, Ohio 44836,)

and)

GAIL GILL, Individually and as parent and next friend of AUSTIN GILL, ASHTYN GILL, and ALEX GILL, minors)
314 Spring Avenue
Clyde, Ohio 43410,)

and)

MELANIE GILL, Individually and as parent and next friend of MCKENNA STRAYER and HUDSON STRAYER, minors)
1750 County Road 181
Green Springs, Ohio 44836,)

and)

MARIAH STRAYER)
1750 County Road 181
Green Springs, Ohio 44836,)

and)

SAM STRAYER)
1750 County Road 181
Green Springs, Ohio 44836,)

and)

ADYSAN GILL)
1173 South Main Street, Unit 401
Clyde, Ohio 43410,)

and)

ABIGAIL GILL)
1750 County Road 181
Green Springs, Ohio 44836,)

Plaintiffs,)

)

vs.)

)

WHIRLPOOL CORPORATION)
c/o CSC-Lawyers Incorporating Services
(Corporation Service Company),)
Statutory Agent
50 West Broad Street, Suite 1800)
Columbus, Ohio 43215,

)

and

)

GRIST MILL CREEK, LLC.
c/o Jonathan W. Abdoo, Statutory Agent)
8 Knobby Drive
Fremont, Ohio 43420,)

and)

JOHN DOE TRUCKING COMPANY)
Address Unknown,

)

and

)

JOHN DOE WASTE REMOVAL COMPANY
Address Unknown,)

and)

JOHN DOE TRUCKING COMPANY)
Address Unknown,
)

and
)

JOHN DOE MAINTENANCE COMPANY
Address Unknown,)

and)

JOHN DOE CORPORATION 1)
Address Unknown,
)

and
)

JOHN DOE CORPORATION 2
Address Unknown,)

Defendants.)

****

Plaintiffs individually, in representative capacities, and as named plaintiffs on behalf of themselves and all other members of the class of persons defined herein, hereby submit their Amended Complaint against defendants as follows:

PARTIES

1. Plaintiff Tim Lagrou is a natural person residing in Fremont, Sandusky County, Ohio. Mr. Lagrou was appointed Administrator of the Estate of Christina Lagrou, deceased, by the Sandusky County Probate Court on October 23, 2006 in Case No. 20061326 and reappointed under the same case number on March 26, 2013. He brings this wrongful death action as

personal representative for the exclusive benefit of the surviving spouse, child, parents, and other next of kin of the deceased. He also brings an individual claim on behalf of his minor child, Hayden Lagrou.

2. Decedent Christina Lagrou used the property located at the intersection of County Roads 187 and 181, formerly known as Whirlpool Park (hereafter, "Whirlpool Park") for its outdoor recreational activities since she was born in 1983. Decedent was born and raised within 1500 feet of Whirlpool Park. Decedent's mother used the park and lived within the areas of toxic explosion in Clyde, Ohio prior to and during the time she was pregnant with decedent. Decedent died at age 23 from large cell lymphoma as a result of exposure to toxic manufacturing chemicals which defendants dumped at Whirlpool Park.

3. Plaintiff Hayden Lagrou is the minor child of Tim and the late Christina Lagrou who was exposed to toxic manufacturing chemicals which defendants dumped or distributed at Whirlpool Park or other locations in and around Clyde, Ohio through his mother, *in utero*.

4. Plaintiff Connie Patrick is a natural person residing in Clyde, Sandusky County, Ohio. She is a property owner whose property has been damaged by defendants, and she has contracted cancer and diabetes and has thyroid as well as neurological illness as a result of her exposure to toxic manufacturing chemicals which defendants dumped or distributed at Whirlpool Park or other locations around Clyde, Ohio.

5. Plaintiff Ryan Patrick is a natural person residing in Clyde, Sandusky County, Ohio. He owns property which has been damaged by defendants and has contracted cancer and diabetes and has thyroid as well as neurological illness as a result of exposure and *in utero* exposure to toxic manufacturing chemicals which defendants dumped or distributed at Whirlpool Park or other locations in and around Clyde, Ohio.

6. Plaintiff Sarah Requena is a natural person residing in Woodville, Wood County, Ohio; plaintiff Connor J. Requena is her minor son.

7. Plaintiff Connor J. Requena has contracted leukemia as a result of exposure and *in utero* exposure to toxic manufacturing chemicals which defendants dumped or distributed at Whirlpool Park or other locations in and around Clyde, Ohio.

8. Plaintiff Brandon Weiker is a natural person residing in Fremont, Sandusky County, Ohio who has contracted leukemia as a result of exposure and *in utero* exposure to toxic manufacturing chemicals which defendants dumped or distributed at Whirlpool Park or other locations in and around Clyde, Ohio.

9. Plaintiff Thomas F. Mathers Jr. is a natural person residing in Delta, Fulton County, Ohio who has contracted non-Hodgkins lymphoma as a result of exposure to toxic manufacturing chemicals which defendants dumped or distributed at Whirlpool Park or other locations in and around Clyde, Ohio.

10. Plaintiff Sandra Sage is a natural person residing in Fremont, Sandusky County, Ohio who has contracted throat cancer as a result of exposure and *in utero* exposure to toxic manufacturing chemicals which defendants dumped or distributed at Whirlpool Park or other locations in and around Clyde, Ohio.

11. Plaintiff Aaron Sage is a natural person residing in Fremont, Sandusky County, Ohio who has suffered thyroid and immune system illness as a result of exposure and *in utero* exposure to toxic manufacturing chemicals which defendants dumped or distributed at Whirlpool Park or other locations in and around Clyde, Ohio.

12. Plaintiff Robbin Krotzer is a natural person residing in Fremont, Sandusky County, Ohio who has suffered neurological damage as a result of exposure and *in utero* exposure to toxic

manufacturing chemicals which defendants dumped or distributed at Whirlpool Park or other locations in and around Clyde, Ohio.

13. Plaintiff Tina Metzger is a natural person residing in Fremont, Sandusky County, Ohio who has suffered neurological damage, thyroid illness, and breast cancer as a result of exposure and *in utero* exposure to toxic manufacturing chemicals which defendants dumped or distributed at Whirlpool Park or other locations in and around Clyde, Ohio.

14. Plaintiff Angela Metzger is a natural person residing in Fremont, Sandusky County, Ohio who has suffered fibromyalgia and cervical cancer as a result of exposure and *in utero* exposure to toxic manufacturing chemicals which defendants dumped or distributed at Whirlpool Park or other locations in and around Clyde, Ohio.

15. Plaintiff Brandon Zienta is a natural person residing in Fremont, Sandusky County, Ohio who has suffered neurological damage, diabetes, and foot cancer as a result of exposure and *in utero* exposure to toxic manufacturing chemicals which defendants dumped or distributed at Whirlpool Park or other locations in and around Clyde, Ohio.

16. Plaintiff Emmagene Hackenburg is a natural person residing in Clyde, Sandusky County, Ohio. She a property owner whose property has been damaged by defendants, and she has contracted an immune disorder as a result of her exposure to toxic manufacturing chemicals which defendants dumped or distributed at Whirlpool Park or other locations in and around Clyde, Ohio.

17. Plaintiff Diane Caldwell is a natural person residing in Clyde, Sandusky County, Ohio. She a property owner whose property has been damaged by defendants, and she has suffered neurological damage as a result of her exposure to toxic manufacturing chemicals which defendants dumped or distributed at Whirlpool Park in Clyde, Ohio.

18. Plaintiff Jason Caldwell is a natural person residing in Clyde, Sandusky County, Ohio who has suffered neurological damage as a result of exposure and *in utero* exposure to toxic manufacturing chemicals which defendants dumped or distributed at Whirlpool Park or other locations in and around Clyde, Ohio.

19. Plaintiff Mark Gill is a natural person residing in Green Springs, Sandusky County, Ohio. Mr. Gill has lived within 1500 feet of Whirlpool Park since 1988. Mr. Gill was born in Green Springs and has used Whirlpool Park for its recreational opportunities including a swimming pool, picnic shelter, basketball courts, tennis court, pond, and other outdoor activities since 1970. Austin, Ashtyn, and Alex are his minor children, and have also used Whirlpool Park for recreational purposes since birth.

20. Plaintiff Gail Gill is a natural person residing in Green Springs, Sandusky County, Ohio. Ms. Gill owned property and lived within 1500 feet of Whirlpool Park from 1986 until 2009. Ms. Gill used Whirlpool Park for recreational purposes since 1970. Austin, Ashtyn, and Alex are her minor children.

21. Plaintiff Alex Gill is the minor child of Mark and Gail Gill. Alex has suffered neurological damage as a result of exposure and *in utero* exposure to toxic manufacturing chemicals which defendants dumped or distributed at Whirlpool Park or other locations in and around Clyde, Ohio.

22. Plaintiff Melanie Gill is a natural person residing in Green Springs, Sandusky County, Ohio. Ms. Gill lives and has owned property within 1500 feet of Whirlpool Park since 2011. Ms. Gill has used Whirlpool Park for recreational purposes since 1970. McKenna and Hudson are her minor children, and have also used Whirlpool Park for recreational purposes since birth.

23. Plaintiff Mariah Strayer is a natural person residing in Green Springs, Sandusky County, Ohio. Ms. Strayer has lived within 1500 feet of Whirlpool Park and used the park for recreational purposes since she was born in 1991.

24. Plaintiff Sam Strayer is a natural person residing in Green Springs, Sandusky County, Ohio. Mr. Strayer has lived within 1500 feet of Whirlpool Park and used the park for recreational purposes since he was born in 1993.

25. Plaintiff Adysan Gill is a natural person residing in Green Springs, Sandusky County, Ohio. Ms. Gill has lived within 1500 feet of Whirlpool Park and used the park for recreational purposes since she was born in 1992.

26. Plaintiff Abigail Gill is a natural person residing in Green Springs, Sandusky County, Ohio. Ms. Gill has lived within 1500 feet of Whirlpool Park and used the park for recreational purposes since she was born in 1995.

27. Defendant Whirlpool Corporation, or its predecessors, is a foreign corporation which manufactures home appliances in Clyde, Sandusky County, Ohio, approximately six (6) miles from Whirlpool Park and the plaintiffs' homes. Defendant Whirlpool owned Whirlpool Park for fifty five (55) years, from 1953-2008. The United States Environmental Protection Agency released a report showing that, at some time during Whirlpool's ownership of the property, dumping of a toxic chemical sludge which included polychlorinated biphenyls occurred at Whirlpool Park.

28. Defendant Grist Mill Creek, LLC is a Limited Liability Company registered in the State of Ohio. Grist Mill Creek, LLC purchased the Whirlpool Park property in 2008 and is the current owner of said property in Green Springs, Sandusky County, Ohio.

29. Defendants John Doe Trucking Company, John Doe Waste Removal Company, John Doe

Trucking Company, John Doe Maintenance Company, and John Doe Corporation 1, and John Doe Corporation 2 are companies or businesses which contributed to or participated in dumping of toxic materials at Whirlpool Park or other locations within the geographic region of the cancer cluster as later defined but which are currently unknown to the plaintiffs and cannot be ascertained with reasonable diligence as the information regarding their names and addresses are possessed by defendant Whirlpool Corporation or other unknown entities.

FACTS

30. Plaintiffs hereby incorporate paragraphs one (1) through twenty-nine (29) of this Complaint as if fully rewritten herein.

31. The property located at the intersection of County Roads 187 and 181, formerly known as Whirlpool Park, was owned and operated by the Whirlpool Corporation as a recreational area for employees and members of the public from the 1950s until it was sold in 2008.

32. Whirlpool Park consisted of a picnic shelter, an in-ground outdoor pool, basketball court, tennis court, volleyball court, creek, pond, and other outdoor recreational amenities.

33. This park was widely used by generations of citizens of Clyde, Green Springs, and Sandusky County for its recreational opportunities.

34. Grist Mill Creek flows north through Whirlpool Park to its confluence with Green Creek, which flows north to Muddy Creek Bay and Lake Erie.

35. The pool at Whirlpool Park was filled using water from Grist Mill Creek which flows north past the basketball courts and toxic sludge dump site in the southeastern corner of the park toward the pool.

36. Beginning in the winter of 2005 lasting into the spring of 2006 the Sandusky County Health

Department ("SCHD") reports that it began to receive telephone calls from concerned residents regarding a large number of childhood and young adult cancer cases in Sandusky County.

37. The large volume of calls regarding high childhood and young adult cancer rates caused SCHD to contact the Ohio Department of Health ("ODH") to request a review of the large number of cancer cases in Sandusky County, particularly the Clyde and Green Creek Township regions. These agencies coordinated on the preliminary investigation which also included private consultation with some of the affected families beginning in June 2006.

38. In the spring of 2007 ODH and SCHD completed an analysis of reported increased cancer cases among residents from 0-19 years of age in Clyde and Green Creek Township for an eleven (11) year time period (1996-2006). This analysis performed by ODH and SCHD revealed a higher number of childhood cancers than expected (10 cases observed; 5.32 expected). Particular cancers of the brain and central nervous system were found to be higher than the number of expected cases (4 cases observed; 0.92 expected).[1]

39. In response to the ODH and SCHD assessment of the high cancer rates, a follow-up assessment titled, "Investigation of Potential Clustering of Invasive Cancers among Children, Adolescents and Young Adults in Sandusky County, Ohio, 1996-2006," was conducted by the Comprehensive Cancer Center and James Cancer Hospital and Solove Research Institute at The Ohio State University, in partnership with the Ohio Cancer Incidence Surveillance System and the Comprehensive Cancer Program at the ODH to determine whether there was clustering of invasive cancers in Sandusky County during the years 1996-2006. The

1 Ohio Department of Health. *Health Consultation: Evaluation of Ohio EPA Soil Sampling in Support of the Clyde and Eastern Sandusky County Childhood Cancer Investigation.* Health Assessment Section, July 28, 2011.

conclusions of this report, using four different methods of analysis, show cancer clustering in the northeastern portion of Sandusky County extending into southeastern Ottawa County and northwestern Erie County with a radius of 7.25 miles. The area defined in this report will be referred to throughout his document as the cancer cluster geographic region.

40. In March of 2008, due to the findings of the ODH and SCHD in addition to concerns regarding chemical contaminants in the local environment, the Ohio Environmental Protection Agency ("Ohio EPA") started environmental monitoring in Clyde, Ohio.

41. On October 30, 2009 the Ohio EPA and ODH identified 14 sites for investigation in a study titled, "Childhood Cancer among Residents of Eastern Sandusky County." Over the next year, the Ohio EPA investigated these 14 sites. No significant findings were made. Coinciding with the investigation of these sites ODH and U.S. Environmental Protection Agency ("U.S. EPA") established a telephone hotline. The hotline provided a method for individuals in the community to inform the U.S. EPA of potential dumpsites in the area.

42. On 14, November 2012 a report was released by the U.S. EPA. The report was prepared by Weston Solutions Inc. for the U.S. EPA. The report is titled, "Site Assessment Report for the Whirlpool Park Site Green Springs, Sandusky County, Ohio." The site assessment of Whirlpool Park was performed due to a complaint received on the U.S. EPA and ODH hotline which included information that the Whirlpool Corporation filled in the area surrounding and under the basketball court in the southeast corner of Whirlpool Park with black sludge-like material.

43. Six soil samples were taken from Whirlpool Park for the site assessment. The assessment concluded that Whirlpool Park has a presence of polychlorinated biphenyls ("PCBs") and total metals in the subsurface soil at levels exceeding the U.S. EPA Regional Screening

Levels ("RSL") for residential properties and that PCBs were present at levels exceeding the U.S. EPA requirements for PCB spill clean up. Two of the soil borings revealed a "9.5-foot layer of mottled gray and black sludge fill material with a petroleum odor" under 0.5 feet of top soil.

44. Defendant Whirlpool Corporation owned Whirlpool Park from 1953 until 2008 when it was sold to defendant Grist Mill Creek, LLC.

45. Defendant Grist Mill Creek, LLC continues to hold the property which contains a toxic chemical dump site which they have failed to decontaminate.

46. Defendant Whirlpool Corporation dumped and disposed of toxic waste materials from its manufacturing facility in Clyde, Sandusky County, Ohio into the ground and water in undisclosed locations around Clyde, Ohio and within the Cancer Cluster geographic region defined, above, in paragraph 24.

47. Defendant Whirlpool Corporation had a duty of ordinary care to its neighbors, including the plaintiffs, which it breached by dumping toxic materials at Whirlpool Park without designating or disclosing the site.

48. Defendant Whirlpool Corporation either knew or should have known that dumping or permitting toxic materials at Whirlpool Park and other locations in the ground and waters of the cancer cluster geographic region would injure its neighbors, including the plaintiffs, and either recklessly or intentionally did so anyway.

49. Defendant Grist Mill Creek, LLC had a duty of ordinary care to its neighbors, including the plaintiffs, which it breached by permitting toxic materials to remain at Whirlpool Park.

50. Defendant Grist Mill Creek, LLC either knew or should have known that permitting toxic materials to remain at Whirlpool Park would injure its neighbors, including the plaintiffs, and

either recklessly or intentionally did so anyway.

51. Defendants John Doe Trucking Company, John Doe Waste Removal Company, John Doe Corporation 1, and John Doe Corporation 2 had a duty of ordinary care to the neighbors of Whirlpool Park and other sites within the geographic region as defined in paragraph 24, above, including the plaintiffs, which they breached by dumping or assisting others to dump toxic materials at Whirlpool Park or other locations.

52. Defendants John Doe Trucking Company, John Doe Waste Removal Company, John Doe Corporation 1, and John Doe Corporation 2 either knew or should have known that dumping toxic materials at Whirlpool Park or other locations would injure its neighbors, including the plaintiffs, and either recklessly or intentionally did so anyway.

53. Due to the causation of the myriad injuries and damage contained in the claims herein having occurred at various times since approximately 1953, many of these claims would be barred by the applicable statutes of limitation if the causation and perpetrators had been previously known; however, these statutes have been tolled because plaintiffs only recently discovered the facts and their claims due to the defendants willful and deliberate failure to disclose and intentional concealment of the existence and contents of its known toxic dump site at Whirlpool Park or other locations in the cancer cluster geographic area.

54. The individual plaintiffs and the class they represent only discovered their claims upon the release of the U.S. EPA report on 14, November 2012 that wrongful acts had been conducted by the defendants which caused their deaths, personal injuries, and property damage.

CLASS ALLEGATIONS

55. Plaintiffs hereby incorporate paragraphs one (1) through fifty-four (54) of this Complaint as

if fully rewritten herein.

56. The named Ohio resident plaintiffs bring this action pursuant to Civ. R. 23, on behalf of themselves and all other members of the class defined as:

a. All Ohio residents who themselves or their parents live or have lived within the cancer cluster geographic region defined in paragraph 24 or who themselves or their parents visited or used Whirlpool Park in its recreational capacity between 1953 and 2008; and,

b. All persons who own property immediately adjacent to or within 4000 feet of Whirlpool Park or any other toxic waste dump site, and within 2000 feet of Grist Mill Creek, Green Creek, or any tributary north of Whirlpool Park or any other tributary flowing out of any other toxic waste dump site.

Numerosity

57. The exact numbers of the class previously identified and described is not known but is estimated to be so numerous that joinder of all class members is impracticable. The class consists of no less than thousands of individuals, far in excess of forty (40) members, who used Whirlpool Park and who own property within the stated radius of the contaminated property and tributaries.

58. A precise determination of the number of class members is only available through information within the exclusive control of the defendants or easily ascertainable from public records.

Commonality

59. There are questions of law or fact common to the class, including but not limited to the following:

a. Whether defendants negligently, recklessly, or intentionally dumped toxic waste containing PCBs and other hazardous chemicals in a recreational area or other locations and knowingly exposed people and property to these waste dump sites from approximately 1953 through the present;

b. Whether defendants' actions of dumping toxic waste without designating or disclosing the site caused property damage to adjacent and nearby properties by causing a diminution in property value; and

c. Whether defendants' negligent dumping of toxic waste containing PCBs and other toxic chemicals in a recreational area formerly known as Whirlpool Park, and at other locations, are causing high rates of cancer and other illnesses, particularly in children and young adults, in the cancer cluster region as defined in paragraph 24.

Typicality

60. The claims of the plaintiffs are typical of the claims of other members of the putative class. The representative parties' claims arise from the same event or practice or course of conduct that give rise to the claims of the other class members and the claims are based on the same legal theory.

61. The personal injuries of class members as well as the damage to real estate owned by the class members was all damaged in the same way, during the same time period, and this condition presents the same types of damage as to each potential class member.

62. Additionally, the risk of serious harm, injury, and disease to each of the class members was created in the same way, by the same defendants during the same time period, and the risk is typical of each class member.

63. Further, the same toxic molecules threaten each of the class members and subject each to the

enhanced risk of the same injuries and disease processes. The U.S. EPA provides uniform standards against which to measure the risk of PCB levels and other toxic chemicals at the property affecting the class.

Adequacy of representation

64. The named plaintiffs will fairly and adequately protect the interests of the class.

65. The named plaintiffs' interests are not antagonistic to, but rather are in unison with, the interests of other class members.

66. The named plaintiffs' counsel have broad experience in handling class action litigation, including chemical spill class actions, and are fully qualified to prosecute the claims of the class in this case. The named plaintiffs' counsel have successfully litigated major class actions on behalf of thousands of claimants, resulting in substantial compensation to those claimants through both settlements and judgments. Class actions litigated by the named plaintiffs' counsel include classes involving environmental contamination.

Superiority of Class Action

67. The questions of law or fact that are common to the class predominate over any questions affecting only individual members. The primary question that will determine defendants' liability to the class is whether defendants negligently dumped toxic materials at the property in question. That question is common to the class as a whole, and it predominates over any questions affecting only individual class members.

68. A class action is superior to other available methods for the fair and efficient adjudication of this controversy. Requiring class members to pursue their claims individually would entail a host of separate suits, with concomitant duplication of costs, attorney's fees, and demands on court resources. Many class members' claims are sufficiently small that they would be

reluctant to incur the substantial cost, expense and risk of pursuing their claims individually. Certification of this case pursuant to Civ. R. 23 will enable the issues to be adjudicated for all class members with the efficiencies of class litigation.

69. This action meets the requirements of Civ. R. 23 because:

a. Common questions of law or fact predominate over questions affecting only individual class members;

b. Separate actions by individual members of the class against the defendants would create a risk inconsistent or varying adjudications with respect to said class members, and incompatible standards of conduct for the defendants;

c. The plaintiffs have no knowledge of any other claims currently pending specifically addressing the issues herein; and

d. Separate prosecution of each individual claim against the defendants would create enormous difficulties and expense for the Court, the individual parties, and the public, requiring each individual claimant to establish liability on the part of the defendants resulting in duplicative and unnecessary consumption of judicial and other resources, and which could result in inconsistent discovery and rulings as well as incomplete fact development thereby depriving the ultimate fact-finder of required information.

COUNT ONE – Damage to Property Interests

70. Plaintiffs hereby incorporate paragraphs one (1) through sixty-nine (69) of this Complaint as if fully rewritten herein.

71. Due to the negligent, reckless, or intentional contamination of Whirlpool Park in Green

Springs, Ohio, and other locations, the real estate owned by the following plaintiffs has been damaged: Connie Patrick, Emmagene Hackenburg, Diane Caldwell, Mark Gill, and Melanie Gill ("Representative Property Plaintiffs"). The value of their properties have been significantly damaged as it is in the immediate vicinity of the contaminated sites, down-stream from said sites, and within the cancer cluster geographic region

72. The contamination, known health effects, and fear which typically result from high levels of PCBs and other toxic chemicals have decreased plaintiffs' property values.

73. Representative Property Plaintiffs, on behalf of themselves and the putative class members, claim damages against all defendants for their lost property values.

74. Defendants' intentional or reckless handling and disposal of toxic and hazardous chemicals, including PCBs, was conducted willfully, wantonly, and maliciously, with a conscious disregard for the lives, health, and property of neighbors and the public including the Representative Property Plaintiffs and members of the class they represent.

COUNT TWO – Continuing Nuisance – Cleanup

75. Plaintiffs hereby incorporate paragraphs one (1) through seventy-four (74) of this Complaint as if fully rewritten herein.

76. Since 1953 the defendants created and maintained a nuisance on the property known as Whirlpool Park and other sites, and the nuisance continues to this day.

77. Defendant Whirlpool Corporation, through its manufacturing processes, caused to be created toxic chemicals which were dumped at Whirlpool Park and other sites in the cancer cluster geographic region.

78. The toxic chemicals have escaped from Whirlpool Park to the lands and property of the

Representative Property Plaintiffs and to the lands of the class of propertied plaintiffs.

79. Defendants intended to cause the formation of these toxic chemicals and that the defendants intended the chemicals to escape to the lands of the Representative Property Plaintiffs and to the lands of the putative class of propertied plaintiffs.

80. Defendants knew or should have known that their conduct in producing and dumping the toxic chemicals and allowing them to escape the undisclosed dump site was and continues to cause a substantial and unreasonable interference with the Representative Property Plaintiffs' interests in the use and safe enjoyment of their respective real estate.

81. The gravity of the harm to the Representative Property Plaintiffs and the class members outweighs the social value of the defendants' activity in their past production and in their present maintaining of toxic chemicals on the contaminated dumping site.

82. As a direct and proximate cause of the defendants' invasion of the property of the Representative Property Plaintiffs and the class with toxic chemicals the plaintiffs' interest in the respective real estate has been injured in the following ways:

    a. diminution in property value due to the toxic chemical dumping site;

    b. cleanup costs associated with the decontamination of their respective properties;

    c. annoyance, discomfort, and inconvenience due to the invasion of toxic chemicals onto their property;

    d. emotional distress and emotional injuries related to the harm caused by the toxic chemicals; and,

    e. physical harm and discomfort due to the invasion of toxic chemicals onto plaintiffs' property.

83. Defendants' intentional or reckless handling and disposal of toxic and hazardous chemicals,

including PCBs, was conducted willfully, wantonly, and maliciously, with a conscious disregard for the lives, health, and property of neighbors and the public including the Representative Property Plaintiffs and members of the class they represent.

84. Representative Property Plaintiffs, on behalf of themselves and the class members, claim entitlement to a thorough clean-up and remediation of Whirlpool Park and all affected areas within the cancer cluster geographic region at the defendants' cost.

COUNT THREE – Medical Monitoring

85. Plaintiffs hereby incorporate paragraphs one (1) through eighty-four (84) of this Complaint as if fully rewritten herein.

86. Sampling data has established that the former Whirlpool Park site is contaminated with a black sludge containing a level of PCBs and metals surpassing U.S. EPA standards.

87. PCBs are a known carcinogen and are hazardous to human health and listed in the top 10% of U.S. EPA's most toxic chemicals.

88. Defendant Whirlpool Corporation dumped and deposited its toxic materials at other currently undisclosed sites in the cancer cluster geographic region containing the same materials deposited into the Whirlpool Park site.

89. Because of the high levels of PCBs, metals, and other toxic chemicals in the environment at Whirlpool Park, all plaintiffs and all members of the class are at an increased risk of contracting one or more serious and life-threatening or life-ending diseases including, but not limited to:

f. Disruption of reproductive functions;

g. Neurobehavioral and developmental deficits in newborns continuing through school-

aged children who had *in utero* exposure;

h. Liver disease, neurological deficits, diabetes, and damage to the thyroid and immune systems; and

i. Cancers, including non-Hodgkin's lymphoma.

90. Early detection of the various cancers, other diseases, and developmental abnormalities increases the chances for successful treatment and management of the aforesaid adverse health conditions. Therefore, it is reasonably necessary for the plaintiffs and those in the class within the cancer cluster geographic region defined in paragraph 24, above, to undergo periodic and regular health monitoring and medical examinations different from that which plaintiffs and members of the class would otherwise undergo in the normal course of their lives had these toxic exposures not occurred.

91. Medical monitoring procedures exist which make early detection of these adverse medical conditions possible and desirable.

92. Plaintiffs, on behalf of themselves and the class members, claim entitlement to medical monitoring at the defendants' cost.

COUNT FOUR – Strict Liability

93. Plaintiffs hereby incorporate paragraphs one (1) through ninety-two (92) of this Complaint as if fully rewritten herein.

94. All plaintiffs allege on behalf of all class members that, irrespective of intent or negligence, defendants' operations at the Whirlpool Park site and all other toxic waste dump and deposit sites within the cancer cluster geographic region are and have been abnormally dangerous.

95. PCBs and the other toxic chemicals found at Whirlpool Park are abnormally dangerous, and

their production and use in manufacturing are abnormally dangerous activities, and it is anticipated the same toxic chemicals exist at other sites.

96. Maintaining, storing, and disposing of PCBs and other toxic chemicals and property contaminated with PCBs are abnormally dangerous activities.

97. Defendants by choosing to use, produce, maintain, store, and dispose of PCBs and other toxic chemicals at their various manufacturing plants and dumping sites chose to create an abnormally dangerous instrumentality and are strictly liable without a showing of negligence for any injury proximately caused to the plaintiffs and the members of the class by that instrumentality.

98. As a direct and proximate result of defendants' activities as mentioned above, but not limited thereto, poisonous and toxic chemicals invaded the persons and property of plaintiffs and the class and have damaged their personal and property interests as set forth above.

99. Plaintiffs, on behalf of themselves and the class members, claim damages and medical monitoring from defendants as previously set forth above.

COUNT FIVE – Personal Injury

100. Plaintiffs hereby incorporate paragraphs one (1) through ninety-nine (99) of this Complaint as if fully rewritten herein.

101. Plaintiffs Connie Patrick, Ryan Patrick, Connor J. Requena, Brandon Weiker, Thomas F. Mathers Jr., Sandra Sage, Aaron Sage, Robbin Krotzer, Tina Metzger, Angela Metzger, Brandon Zienta, Emmagene Hackenburg, Diane Caldwell, and Jason Caldwell ("Personal Injury Plaintiffs") have suffered from personal injury including but not limited to the following illnesses and diseases: disruption of reproductive functions, neurobehavioral

and developmental deficits in newborns continuing through school-aged children who had *in utero* exposure, liver disease, neurological deficits, diabetes, damage to the thyroid and immune systems, and cancers, including non-Hodgkin's lymphoma.

102. As a direct and proximate result of defendants' intentional, reckless, or negligent handling and disposal of toxic and hazardous chemicals, including PCB's, Personal Injury Plaintiffs were caused personal injury, pain, suffering, disability, interference with usual daily activities, out-of-pocket costs, medical testing, medical treatment, and medical expenses.

103. As a direct and proximate result of defendants' intentional, reckless, or negligent handling and disposal of toxic and hazardous chemicals, including PCB's, Personal Injury Plaintiffs have suffered neurological defects and developmental disabilities.

104. As a direct and proximate result of defendants' intentional, reckless, or negligent acts the Personal Injury Plaintiffs have each been damaged in an amount in excess of Twenty-Five Thousand Dollars ($25,000.00).

105. Defendants' intentional or reckless handling and disposal of toxic and hazardous chemicals, including PCBs, was conducted willfully, wantonly, and maliciously, with a conscious disregard for the lives, health, and property of neighbors and the public including the Personal Injury Plaintiffs, for which the Personal Injury Plaintiffs claim punitive damages in an appropriate amount.

106. Personal Injury Plaintiffs make no class action allegations at this time, but reserve the right to do so in the future if warranted.

COUNT SIX – Wrongful Death

107. Plaintiffs hereby incorporate paragraphs one (1) through one hundred six (106) of this Complaint as if fully rewritten herein.

108. Plaintiff Tim Lagrou was appointed Administrator of the Estate of Christina Lagrou, deceased, by the Sandusky County Probate Court on October 23, 2006, in Case No. 20061326 and reappointed under the same case number on March 26, 2013. He brings this wrongful death action as personal representative for the exclusive benefit of the surviving spouse, child, parents, and other next of kin of the deceased.

109. Christina Lagrou, age 23, died from Large Cell Lymphoma on October 21, 2006; at the time the cause of her cancer was unknown.

110. Christina Lagrou was survived by her husband, Tim Lagrou, and her minor child, Hayden Lagrou.

111. Christina Lagrou, age 23, had a life expectancy of 78.10 years at the time of her death. Her beneficiaries suffered damages of loss of support from her reasonably expected earning capacity.

112. Decedent's beneficiaries suffered damages for loss of her services over the time she would have lived.

113. Decedent's beneficiaries suffered damages for the loss of her society over her life expectancy, including loss of companionship, consortium, care, assistance, attention, protection, advice, guidance, counsel, instruction, training, and education.

114. Decedent's heirs at law at the time of her death suffered damages for loss of prospective inheritance.

115. Decedent's beneficiaries suffered damages for the mental anguish caused by her

death.

116. Reasonable funeral and burial expenses in the amount of $4,500.00 or more have been incurred.

117. Decedent's death was caused by defendants' intentional, reckless, or negligent handling and disposal of toxic and hazardous chemicals, including PCBs, for which plaintiff Tim Lagrou claims damages on behalf of his late wife's estate and beneficiaries in an amount in excess of Twenty-Five Thousand Dollars ($25,000.00).

118. Defendants' intentional or reckless handling and disposal of toxic and hazardous chemicals, including PCBs, was conducted willfully, wantonly, and maliciously, with a conscious disregard for the lives, health, and property of neighbors and the public including plaintiff's, for which plaintiff claims punitive damages in an appropriate amount.

119. Plaintiff Tim Lagrou makes no class action allegations at this time, but reserves the right to do so in the future if warranted.

PRAYER FOR RELIEF

WHEREFORE, the plaintiffs individually, in representative capacities, and as named plaintiffs on behalf of themselves and all other members of the class of persons defined herein, respectfully pray this honorable Court grant them the following relief:

a. Certify this case as a class action pursuant to Civ. R. 23 on behalf of the named plaintiffs and other members of the class;

b. Enter judgment against defendants and in favor of the named plaintiffs and other class members;

c. Award compensatory damages to the individual plaintiffs, named plaintiffs, and

class members to which they are entitled in excess of $25,000.00 each, together with interest thereon at the maximum rate allowable by law;

d. Award punitive damages to the individual plaintiffs, named plaintiffs, and class members to which they are entitled in the aggregate amount of $750 Million;

e. Create a medical monitoring fund for the class at an amount sufficient to provide for testing of their persons to determine body burden of PCBs and other toxic chemicals in an amount sufficient to ensure ongoing examinations and tests to provide for early detection of disease related to exposure to toxic waste;

f. Create a cleanup fund for the class at an amount sufficient to provide for the decontamination of the dump site, real estate, and public property invaded and contaminated by the toxic chemicals; and

g. Grant plaintiffs their costs and litigation expenses, reasonable attorney fees, and such further relief as the Court deems just or equitable.

Respectfully submitted,

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Counsel for Plaintiffs

JURY DEMAND

The plaintiffs hereby demand a trial by jury of any and all issues ~~so triable herein~~.

Counsel for Plaintiffs

PRAECIPE

To the Clerk:

Please be so kind as to serve defendants Whirlpool Corporation and Grist Mill Creek, LLC with copies of the Amended Complaint herein at their addresses as shown on the caption hereof by Certified U.S. Mail, return receipt requested, or by other means in accord with the Ohio Rules of Civil Procedure.

Thank you very much.

Counsel for Plaintiffs

EXHIBIT B

Table 1.14

Lifetime Risk (Percent) of Being Diagnosed with Cancer by Site and Race/Ethnicity

Both Sexes, 18 SEER Areas, 2007-2009

Site	All Races	Whites	Blacks
	Percent (95% C.I.)	Percent (95% C.I.)	Percent (95% C.I.)
All Sites	41.24 (41.15, 41.33)	41.48 (41.38, 41.58)	37.91 (37.65, 38.18)
Invasive and In Situ	43.60 (43.50, 43.69)	43.86 (43.76, 43.97)	39.30 (39.03, 39.57)
Oral Cavity and Pharynx	1.08 (1.06, 1.09)	1.12 (1.10, 1.13)	0.82 (0.78, 0.85)
Esophagus	0.51 (0.50, 0.52)	0.53 (0.52, 0.54)	0.49 (0.46, 0.52)
Stomach	0.86 (0.85, 0.88)	0.75 (0.73, 0.76)	1.14 (1.10, 1.19)
Colon and Rectum	4.96 (4.93, 5.00)	4.89 (4.86, 4.93)	5.05 (4.95, 5.15)
Invasive and In Situ	5.18 (5.14, 5.21)	5.09 (5.05, 5.12)	5.32 (5.22, 5.42)
Liver and Intrahepatic Bile Duct	0.83 (0.82, 0.84)	0.72 (0.71, 0.74)	0.86 (0.82, 0.89)
Pancreas	1.47 (1.45, 1.48)	1.45 (1.43, 1.47)	1.53 (1.48, 1.59)
Larynx	0.36 (0.35, 0.37)	0.37 (0.36, 0.37)	0.46 (0.43, 0.49)
Invasive and In Situ	0.39 (0.38, 0.40)	0.39 (0.39, 0.40)	0.49 (0.46, 0.52)
Lung and Bronchus	6.99 (6.96, 7.03)	7.19 (7.15, 7.23)	6.57 (6.46, 6.68)
Melanoma of the Skin	1.99 (1.98, 2.01)	2.32 (2.30, 2.34)	0.09 (0.07, 0.10)
Invasive and In Situ	3.25 (3.23, 3.28)	3.71 (3.68, 3.74)	0.11 (0.10, 0.13)
Breast	6.41 (6.38, 6.45)	6.53 (6.49, 6.57)	5.81 (5.72, 5.91)
Invasive and In Situ	7.70 (7.66, 7.73)	7.81 (7.77, 7.85)	7.00 (6.89, 7.10)
Urinary Bladder (Invasive and In Situ)	2.39 (2.37, 2.41)	2.59 (2.56, 2.62)	1.19 (1.15, 1.24)
Kidney and Renal Pelvis	1.60 (1.59, 1.62)	1.65 (1.63, 1.67)	1.55 (1.50, 1.60)
Brain and Other Nervous System	0.62 (0.61, 0.63)	0.68 (0.67, 0.69)	0.35 (0.32, 0.37)
Thyroid	1.03 (1.01, 1.04)	1.07 (1.06, 1.09)	0.57 (0.54, 0.59)
Hodgkin Lymphoma	0.23 (0.22, 0.23)	0.25 (0.24, 0.25)	0.20 (0.19, 0.22)
Non-Hodgkin Lymphoma	2.12 (2.10, 2.14)	2.23 (2.21, 2.25)	1.22 (1.17, 1.26)
Myeloma	0.67 (0.66, 0.68)	0.61 (0.60, 0.63)	1.12 (1.07, 1.17)
Leukemia	1.35 (1.33, 1.36)	1.41 (1.39, 1.43)	0.89 (0.85, 0.93)
Acute Lymphocytic Leukemia	0.13 (0.12, 0.13)	0.14 (0.13, 0.14)	0.07 (0.06, 0.08)
Chronic Lymphocytic Leukemia	0.49 (0.48, 0.50)	0.53 (0.51, 0.54)	0.27 (0.25, 0.30)
Acute Myeloid Leukemia	0.39 (0.38, 0.40)	0.40 (0.39, 0.41)	0.29 (0.27, 0.31)
Chronic Myeloid Leukemia	0.17 (0.16, 0.17)	0.17 (0.16, 0.18)	0.13 (0.12, 0.15)
Kaposi Sarcoma	0.05 (0.04, 0.05)	0.04 (0.04, 0.05)	0.07 (0.06, 0.08)
Mesothelioma	0.13 (0.12, 0.13)	0.14 (0.14, 0.15)	0.05 (0.04, 0.06)

Source: Devcan Version 6.6.1, April 2012, National Cancer Institute (http://surveillance.cancer.gov/devcan/). SEER 18 areas (San Francisco, Connecticut, Detroit, Hawaii, Iowa, New Mexico, Seattle, Utah, Atlanta, San Jose-Monterey, Los Angeles, Alaska Native Registry, Rural Georgia, California excluding SF/SJM/LA, Kentucky, Louisiana, New Jersey, and Georgia excluding ATL/RG).

Note: Invasive cancer only unless specified otherwise.
A percent or confidence interval value of 0.00 represents a value that is below 0.005.

Table 1.14 - continued

Lifetime Risk (Percent) of Being Diagnosed with Cancer by Site and Race/Ethnicity

Both Sexes, 18 SEER Areas, 2007-2009

Site	Asian/Pacific Islanders Percent (95% C.I.)	American Indian/ Alaska Natives[a] Percent (95% C.I.)	Hispanics[b] Percent (95% C.I.)
All Sites	35.78 (35.41, 36.16)	28.48 (27.35, 29.73)	37.35 (37.02, 37.69)
Invasive and In Situ	37.27 (36.90, 37.66)	29.16 (28.02, 30.42)	38.68 (38.34, 39.03)
Oral Cavity and Pharynx	0.88 (0.83, 0.94)	0.81 (0.58, 1.20)	0.75 (0.70, 0.80)
Esophagus	0.33 (0.29, 0.37)	0.37 (0.26, 0.66)	0.36 (0.33, 0.40)
Stomach	1.90 (1.81, 2.00)	0.97 (0.79, 1.31)	1.48 (1.41, 1.56)
Colon and Rectum	5.16 (5.01, 5.31)	4.01 (3.61, 4.53)	4.68 (4.55, 4.81)
Invasive and In Situ	5.35 (5.21, 5.51)	4.13 (3.73, 4.66)	4.88 (4.76, 5.02)
Liver and Intrahepatic Bile Duct	1.92 (1.84, 2.01)	1.41 (1.19, 1.76)	1.45 (1.39, 1.52)
Pancreas	1.57 (1.48, 1.67)	1.19 (0.96, 1.55)	1.58 (1.51, 1.67)
Larynx	0.16 (0.14, 0.20)	0.26 (0.17, 0.54)	0.29 (0.27, 0.33)
Invasive and In Situ	0.17 (0.15, 0.21)	0.27 (0.18, 0.55)	0.31 (0.29, 0.35)
Lung and Bronchus	5.69 (5.53, 5.85)	4.44 (4.00, 5.00)	4.34 (4.22, 4.46)
Melanoma of the Skin	0.17 (0.15, 0.21)	0.35 (0.25, 0.62)	0.51 (0.47, 0.56)
Invasive and In Situ	0.22 (0.19, 0.26)	0.51 (0.38, 0.80)	0.76 (0.72, 0.82)
Breast	5.43 (5.31, 5.56)	3.75 (3.42, 4.21)	5.10 (4.99, 5.22)
Invasive and In Situ	6.83 (6.70, 6.97)	4.23 (3.88, 4.70)	6.00 (5.89, 6.13)
Urinary Bladder (Invasive and In Situ)	1.39 (1.31, 1.48)	0.91 (0.71, 1.26)	1.57 (1.49, 1.66)
Kidney and Renal Pelvis	1.06 (1.00, 1.13)	2.05 (1.74, 2.49)	1.75 (1.68, 1.82)
Brain and Other Nervous System	0.39 (0.36, 0.44)	0.37 (0.22, 0.70)	0.56 (0.52, 0.60)
Thyroid	1.17 (1.12, 1.23)	0.64 (0.47, 0.97)	0.95 (0.91, 1.00)
Hodgkin Lymphoma	0.11 (0.10, 0.14)	0.09 (0.03, 0.36)	0.22 (0.21, 0.25)
Non-Hodgkin Lymphoma	1.84 (1.75, 1.93)	1.26 (1.01, 1.65)	2.13 (2.05, 2.21)
Myeloma	0.48 (0.44, 0.53)	0.47 (0.30, 0.82)	0.67 (0.63, 0.72)
Leukemia	0.92 (0.86, 0.98)	0.81 (0.63, 1.14)	1.11 (1.06, 1.17)
Acute Lymphocytic Leukemia	0.11 (0.09, 0.14)	0.11 (0.07, 0.37)	0.19 (0.18, 0.21)
Chronic Lymphocytic Leukemia	0.14 (0.12, 0.17)	0.16 (0.08, 0.44)	0.26 (0.23, 0.30)
Acute Myeloid Leukemia	0.40 (0.36, 0.45)	0.29 (0.20, 0.57)	0.35 (0.32, 0.39)
Chronic Myeloid Leukemia	0.13 (0.11, 0.16)	0.12 (0.05, 0.39)	0.15 (0.13, 0.18)
Kaposi Sarcoma	0.02 (0.01, 0.04)	0.02 (0.00, 0.29)	0.08 (0.06, 0.10)
Mesothelioma	0.05 (0.04, 0.07)	0.10 (0.04, 0.37)	0.12 (0.10, 0.14)

Devcan Version 6.6.1, April 2012, National Cancer Institute (http://surveillance.cancer.gov/devcan/).

Source: SEER 18 areas (San Francisco, Connecticut, Detroit, Hawaii, Iowa, New Mexico, Seattle, Utah, Atlanta, San Jose-Monterey, Los Angeles, Alaska Native Registry, Rural Georgia, California excluding SF/SJM/LA, Kentucky, Louisiana, New Jersey, and Georgia excluding ATL/RG).

Note: Invasive cancer only unless specified otherwise.

[a] Underlying incidence data for American Indian/Alaska Native are based on the CHSDA(Contract Health Service Delivery Area) counties.

[b] Hispanic is not mutually exclusive from whites, blacks, Asian Pacific Islanders, and American Indians/Alaska Natives. Underlying incidence data for Hispanics are based on NHIA and exclude cases from the Alaska Native Registry.

A percent or confidence interval value of 0.00 represents a value that is below 0.005.

Table 1.15

Lifetime Risk (Percent) of Being Diagnosed with Cancer by Site and Race/Ethnicity

Males, 18 SEER Areas, 2007-2009

Site	All Races	Whites	Blacks
	Percent (95% C.I.)	Percent (95% C.I.)	Percent (95% C.I.)
All Sites	44.81 (44.67, 44.95)	44.55 (44.40, 44.70)	42.77 (42.35, 43.19)
Invasive and In Situ	46.19 (46.05, 46.33)	45.96 (45.81, 46.12)	43.11 (42.69, 43.53)
Oral Cavity and Pharynx	1.50 (1.48, 1.53)	1.55 (1.53, 1.58)	1.18 (1.12, 1.24)
Esophagus	0.81 (0.79, 0.83)	0.85 (0.83, 0.87)	0.71 (0.66, 0.76)
Stomach	1.09 (1.07, 1.11)	0.96 (0.94, 0.98)	1.39 (1.31, 1.47)
Colon and Rectum	5.17 (5.13, 5.22)	5.11 (5.06, 5.16)	5.07 (4.93, 5.21)
Invasive and In Situ	5.40 (5.36, 5.45)	5.33 (5.28, 5.38)	5.34 (5.20, 5.49)
Liver and Intrahepatic Bile Duct	1.18 (1.16, 1.20)	1.03 (1.01, 1.05)	1.28 (1.22, 1.35)
Pancreas	1.48 (1.46, 1.51)	1.48 (1.46, 1.51)	1.48 (1.40, 1.56)
Larynx	0.60 (0.59, 0.62)	0.61 (0.59, 0.62)	0.79 (0.73, 0.84)
Invasive and In Situ	0.65 (0.64, 0.67)	0.66 (0.64, 0.67)	0.84 (0.79, 0.90)
Lung and Bronchus	7.77 (7.71, 7.82)	7.82 (7.76, 7.89)	7.95 (7.77, 8.13)
Melanoma of the Skin	2.49 (2.45, 2.52)	2.87 (2.84, 2.91)	0.08 (0.06, 0.10)
Invasive and In Situ	4.02 (3.98, 4.06)	4.56 (4.51, 4.61)	0.10 (0.08, 0.12)
Breast	0.13 (0.12, 0.14)	0.13 (0.12, 0.14)	0.14 (0.12, 0.17)
Invasive and In Situ	0.14 (0.14, 0.15)	0.14 (0.13, 0.15)	0.16 (0.14, 0.19)
Prostate	16.15 (16.07, 16.23)	15.39 (15.30, 15.48)	19.74 (19.47, 20.02)
Testis	0.37 (0.36, 0.38)	0.44 (0.43, 0.45)	0.09 (0.08, 0.11)
Urinary Bladder (Invasive and In Situ)	3.81 (3.77, 3.85)	4.13 (4.09, 4.18)	1.71 (1.62, 1.80)
Kidney and Renal Pelvis	2.04 (2.01, 2.06)	2.10 (2.06, 2.13)	1.90 (1.82, 1.99)
Brain and Other Nervous System	0.70 (0.68, 0.71)	0.77 (0.75, 0.79)	0.36 (0.33, 0.40)
Thyroid	0.52 (0.51, 0.54)	0.56 (0.54, 0.57)	0.25 (0.22, 0.28)
Hodgkin Lymphoma	0.25 (0.24, 0.26)	0.27 (0.26, 0.28)	0.22 (0.20, 0.24)
Non-Hodgkin Lymphoma	2.34 (2.31, 2.37)	2.46 (2.42, 2.49)	1.30 (1.24, 1.37)
Myeloma	0.77 (0.76, 0.79)	0.73 (0.71, 0.75)	1.19 (1.12, 1.26)
Leukemia	1.59 (1.56, 1.61)	1.67 (1.64, 1.69)	1.00 (0.94, 1.06)
Acute Lymphocytic Leukemia	0.14 (0.13, 0.14)	0.15 (0.14, 0.16)	0.08 (0.07, 0.10)
Chronic Lymphocytic Leukemia	0.61 (0.60, 0.63)	0.65 (0.63, 0.67)	0.34 (0.30, 0.39)
Acute Myeloid Leukemia	0.44 (0.42, 0.45)	0.46 (0.44, 0.47)	0.28 (0.25, 0.32)
Chronic Myeloid Leukemia	0.20 (0.19, 0.21)	0.21 (0.20, 0.22)	0.15 (0.13, 0.18)
Kaposi Sarcoma	0.08 (0.08, 0.09)	0.07 (0.07, 0.08)	0.13 (0.11, 0.15)
Mesothelioma	0.21 (0.20, 0.22)	0.24 (0.23, 0.25)	0.08 (0.06, 0.11)

Devcan Version 6.6.1, April 2012, National Cancer Institute (http://surveillance.cancer.gov/devcan/).
Source: SEER 18 areas (San Francisco, Connecticut, Detroit, Hawaii, Iowa, New Mexico, Seattle, Utah, Atlanta, San Jose-Monterey, Los Angeles, Alaska Native Registry, Rural Georgia, California excluding SF/SJM/LA, Kentucky, Louisiana, New Jersey, and Georgia excluding ATL/RG).
Note: Invasive cancer only unless specified otherwise.
A percent or confidence interval value of 0.00 represents a value that is below 0.005.

Table 1.15 - continued

Lifetime Risk (Percent) of Being Diagnosed with Cancer by Site and Race/Ethnicity

Males, 18 SEER Areas, 2007-2009

Site	Asian/Pacific Islanders Percent (95% C.I.)	American Indian/ Alaska Natives[a] Percent (95% C.I.)	Hispanics[b] Percent (95% C.I.)
All Sites	37.88 (37.32, 38.45)	29.30 (27.62, 31.29)	40.63 (40.09, 41.19)
Invasive and In Situ	38.22 (37.66, 38.80)	29.61 (27.91, 31.61)	41.13 (40.58, 41.69)
Oral Cavity and Pharynx	1.21 (1.12, 1.31)	1.14 (0.73, 1.99)	0.98 (0.91, 1.08)
Esophagus	0.45 (0.40, 0.52)	0.51 (0.30, 1.21)	0.59 (0.54, 0.67)
Stomach	2.19 (2.05, 2.34)	1.21 (0.91, 1.96)	1.82 (1.70, 1.97)
Colon and Rectum	5.36 (5.16, 5.58)	4.08 (3.50, 5.01)	5.13 (4.93, 5.34)
Invasive and In Situ	5.58 (5.37, 5.80)	4.22 (3.63, 5.16)	5.34 (5.14, 5.56)
Liver and Intrahepatic Bile Duct	2.64 (2.51, 2.79)	1.99 (1.61, 2.76)	1.88 (1.79, 1.99)
Pancreas	1.52 (1.40, 1.66)	1.18 (0.86, 1.94)	1.43 (1.34, 1.55)
Larynx	0.30 (0.25, 0.36)	0.47 (0.30, 1.16)	0.56 (0.50, 0.63)
Invasive and In Situ	0.32 (0.27, 0.38)	0.49 (0.31, 1.18)	0.59 (0.54, 0.67)
Lung and Bronchus	7.13 (6.87, 7.40)	4.83 (4.16, 5.85)	5.02 (4.83, 5.24)
Melanoma of the Skin	0.20 (0.16, 0.26)	0.38 (0.24, 1.06)	0.52 (0.46, 0.61)
Invasive and In Situ	0.24 (0.20, 0.31)	0.63 (0.40, 1.34)	0.80 (0.71, 0.91)
Breast	0.09 (0.07, 0.14)	0.11 (0.04, 0.80)	0.08 (0.06, 0.13)
Invasive and In Situ	0.11 (0.08, 0.16)	0.11 (0.04, 0.80)	0.09 (0.07, 0.14)
Prostate	11.14 (10.85, 11.44)	7.59 (6.78, 8.73)	15.02 (14.71, 15.35)
Testis	0.14 (0.12, 0.19)	0.30 (0.21, 0.95)	0.33 (0.31, 0.38)
Urinary Bladder (Invasive and In Situ)	2.23 (2.09, 2.40)	1.49 (1.13, 2.26)	2.56 (2.39, 2.74)
Kidney and Renal Pelvis	1.38 (1.28, 1.50)	2.51 (1.97, 3.44)	2.15 (2.05, 2.27)
Brain and Other Nervous System	0.42 (0.38, 0.49)	0.29 (0.19, 0.96)	0.57 (0.51, 0.65)
Thyroid	0.55 (0.50, 0.62)	0.23 (0.14, 0.90)	0.42 (0.37, 0.49)
Hodgkin Lymphoma	0.13 (0.11, 0.17)	0.06 (0.03, 0.76)	0.24 (0.22, 0.30)
Non-Hodgkin Lymphoma	2.06 (1.94, 2.20)	1.32 (1.02, 2.05)	2.20 (2.08, 2.34)
Myeloma	0.55 (0.49, 0.63)	0.55 (0.22, 1.41)	0.75 (0.68, 0.84)
Leukemia	1.05 (0.96, 1.15)	0.98 (0.66, 1.75)	1.30 (1.20, 1.43)
Acute Lymphocytic Leukemia	0.12 (0.09, 0.17)	0.12 (0.06, 0.80)	0.19 (0.17, 0.24)
Chronic Lymphocytic Leukemia	0.19 (0.15, 0.25)	0.28 (0.11, 0.99)	0.33 (0.28, 0.42)
Acute Myeloid Leukemia	0.43 (0.37, 0.50)	0.24 (0.13, 0.92)	0.41 (0.34, 0.50)
Chronic Myeloid Leukemia	0.18 (0.15, 0.23)	0.16 (0.04, 0.87)	0.18 (0.15, 0.24)
Kaposi Sarcoma	0.03 (0.02, 0.07)	0.02 (0.00, 0.73)	0.12 (0.09, 0.18)
Mesothelioma	0.08 (0.05, 0.13)	0.12 (0.04, 0.81)	0.20 (0.16, 0.26)

Devcan Version 6.6.1, April 2012, National Cancer Institute (http://surveillance.cancer.gov/devcan/).
Source: SEER 18 areas (San Francisco, Connecticut, Detroit, Hawaii, Iowa, New Mexico, Seattle, Utah, Atlanta, San Jose-Monterey, Los Angeles, Alaska Native Registry, Rural Georgia, California excluding SF/SJM/LA, Kentucky, Louisiana, New Jersey, and Georgia excluding ATL/RG).
Note: Invasive cancer only unless specified otherwise.
[a] Underlying incidence data for American Indian/Alaska Native are based on the CHSDA(Contract Health Service Delivery Area) counties.
[b] Hispanic is not mutually exclusive from whites, blacks, Asian Pacific Islanders, and American Indians/Alaska Natives. Underlying incidence data for Hispanics are based on NHIA and exclude cases from the Alaska Native Registry.
A percent or confidence interval value of 0.00 represents a value that is below 0.005.

Table 1.16

Lifetime Risk (Percent) of Being Diagnosed with Cancer by Site and Race/Ethnicity

Females, 18 SEER Areas, 2007-2009

Site	All Races	Whites	Blacks
	Percent (95% C.I.)	Percent (95% C.I.)	Percent (95% C.I.)
All Sites	38.17 (38.05, 38.29)	38.87 (38.74, 39.00)	33.72 (33.38, 34.07)
Invasive and In Situ	41.51 (41.38, 41.63)	42.24 (42.11, 42.38)	36.05 (35.70, 36.41)
Oral Cavity and Pharynx	0.68 (0.66, 0.69)	0.70 (0.68, 0.71)	0.49 (0.46, 0.54)
Esophagus	0.23 (0.22, 0.24)	0.23 (0.22, 0.24)	0.29 (0.26, 0.32)
Stomach	0.66 (0.65, 0.68)	0.55 (0.53, 0.56)	0.94 (0.88, 1.00)
Colon and Rectum	4.78 (4.74, 4.82)	4.69 (4.64, 4.73)	5.04 (4.91, 5.18)
Invasive and In Situ	4.97 (4.93, 5.01)	4.86 (4.82, 4.91)	5.30 (5.17, 5.44)
Liver and Intrahepatic Bile Duct	0.49 (0.48, 0.51)	0.43 (0.41, 0.44)	0.48 (0.44, 0.52)
Pancreas	1.45 (1.43, 1.47)	1.42 (1.40, 1.45)	1.59 (1.51, 1.67)
Larynx	0.14 (0.13, 0.14)	0.14 (0.13, 0.15)	0.17 (0.15, 0.20)
Invasive and In Situ	0.15 (0.14, 0.15)	0.15 (0.14, 0.16)	0.18 (0.16, 0.21)
Lung and Bronchus	6.35 (6.30, 6.40)	6.67 (6.61, 6.72)	5.40 (5.26, 5.54)
Melanoma of the Skin	1.58 (1.55, 1.60)	1.85 (1.82, 1.87)	0.09 (0.08, 0.12)
Invasive and In Situ	2.60 (2.57, 2.63)	2.99 (2.95, 3.02)	0.12 (0.10, 0.14)
Breast	12.38 (12.31, 12.44)	12.73 (12.65, 12.80)	10.87 (10.69, 11.05)
Invasive and In Situ	14.90 (14.83, 14.97)	15.25 (15.17, 15.33)	13.09 (12.90, 13.29)
Cervix Uteri	0.68 (0.67, 0.69)	0.65 (0.64, 0.67)	0.84 (0.80, 0.89)
Corpus and Uterus, NOS	2.64 (2.61, 2.67)	2.72 (2.69, 2.75)	2.30 (2.21, 2.38)
Invasive and In Situ	2.67 (2.64, 2.70)	2.74 (2.71, 2.78)	2.32 (2.24, 2.41)
Ovary[a]	1.38 (1.36, 1.41)	1.46 (1.43, 1.48)	1.00 (0.94, 1.06)
Urinary Bladder (Invasive and In Situ)	1.15 (1.13, 1.17)	1.22 (1.20, 1.25)	0.76 (0.71, 0.82)
Kidney and Renal Pelvis	1.20 (1.18, 1.22)	1.23 (1.21, 1.25)	1.24 (1.18, 1.31)
Brain and Other Nervous System	0.55 (0.54, 0.57)	0.60 (0.59, 0.62)	0.33 (0.30, 0.37)
Thyroid	1.53 (1.51, 1.56)	1.61 (1.59, 1.64)	0.86 (0.81, 0.90)
Hodgkin Lymphoma	0.21 (0.20, 0.22)	0.23 (0.22, 0.24)	0.18 (0.17, 0.21)
Non-Hodgkin Lymphoma	1.93 (1.90, 1.95)	2.03 (2.00, 2.06)	1.14 (1.08, 1.20)
Myeloma	0.57 (0.56, 0.59)	0.51 (0.50, 0.53)	1.06 (1.00, 1.12)
Leukemia	1.14 (1.12, 1.16)	1.18 (1.16, 1.20)	0.80 (0.75, 0.86)
Acute Lymphocytic Leukemia	0.11 (0.11, 0.12)	0.12 (0.12, 0.13)	0.06 (0.05, 0.07)
Chronic Lymphocytic Leukemia	0.39 (0.38, 0.40)	0.42 (0.40, 0.43)	0.21 (0.18, 0.24)
Acute Myeloid Leukemia	0.36 (0.35, 0.37)	0.36 (0.35, 0.37)	0.30 (0.27, 0.33)
Chronic Myeloid Leukemia	0.13 (0.13, 0.14)	0.14 (0.13, 0.14)	0.12 (0.10, 0.14)
Kaposi Sarcoma	0.01 (0.01, 0.01)	0.01 (0.01, 0.01)	0.01 (0.01, 0.02)
Mesothelioma	0.05 (0.05, 0.06)	0.06 (0.06, 0.07)	0.02 (0.02, 0.04)

Devcan Version 6.6.1, April 2012, National Cancer Institute (http://surveillance.cancer.gov/devcan/).
Source: SEER 18 areas (San Francisco, Connecticut, Detroit, Hawaii, Iowa, New Mexico, Seattle, Utah, Atlanta, San Jose-Monterey, Los Angeles, Alaska Native Registry, Rural Georgia, California excluding SF/SJM/LA, Kentucky, Louisiana, New Jersey, and Georgia excluding ATL/RG).
Note: Invasive cancer only unless specified otherwise.
[a] Ovary excludes borderline cases or histologies 8442, 8451, 8462, 8472, and 8473.
A percent or confidence interval value of 0.00 represents a value that is below 0.005.

Table 1.16 - continued

Lifetime Risk (Percent) of Being Diagnosed with Cancer by Site and Race/Ethnicity

Females, 18 SEER Areas, 2007-2009

Site	Asian/Pacific Islanders Percent (95% C.I.)	American Indian/ Alaska Natives[a] Percent (95% C.I.)	Hispanics[b] Percent (95% C.I.)
All Sites	34.20 (33.70, 34.71)	27.91 (26.37, 29.66)	35.03 (34.59, 35.48)
Invasive and In Situ	36.70 (36.20, 37.23)	28.99 (27.43, 30.74)	37.19 (36.74, 37.64)
Oral Cavity and Pharynx	0.60 (0.53, 0.68)	0.52 (0.26, 1.10)	0.54 (0.48, 0.61)
Esophagus	0.22 (0.17, 0.29)	0.25 (0.14, 0.72)	0.15 (0.12, 0.20)
Stomach	1.66 (1.54, 1.80)	0.76 (0.54, 1.27)	1.20 (1.11, 1.30)
Colon and Rectum	4.98 (4.78, 5.20)	3.96 (3.42, 4.73)	4.31 (4.14, 4.49)
Invasive and In Situ	5.15 (4.95, 5.37)	4.08 (3.53, 4.85)	4.50 (4.33, 4.69)
Liver and Intrahepatic Bile Duct	1.30 (1.20, 1.41)	0.86 (0.64, 1.38)	1.02 (0.94, 1.12)
Pancreas	1.61 (1.49, 1.76)	1.20 (0.89, 1.77)	1.69 (1.58, 1.82)
Larynx	0.05 (0.03, 0.10)	0.07 (0.02, 0.53)	0.07 (0.05, 0.10)
Invasive and In Situ	0.05 (0.03, 0.10)	0.08 (0.03, 0.54)	0.07 (0.06, 0.10)
Lung and Bronchus	4.49 (4.30, 4.70)	4.11 (3.54, 4.91)	3.80 (3.65, 3.96)
Melanoma of the Skin	0.16 (0.12, 0.21)	0.32 (0.20, 0.77)	0.51 (0.46, 0.58)
Invasive and In Situ	0.20 (0.16, 0.26)	0.42 (0.28, 0.88)	0.77 (0.70, 0.84)
Breast	10.11 (9.88, 10.35)	7.28 (6.63, 8.13)	9.83 (9.62, 10.04)
Invasive and In Situ	12.74 (12.49, 13.00)	8.23 (7.55, 9.11)	11.60 (11.39, 11.83)
Cervix Uteri	0.69 (0.64, 0.76)	0.65 (0.49, 1.11)	1.05 (0.99, 1.12)
Corpus and Uterus, NOS	2.10 (2.01, 2.21)	1.90 (1.59, 2.46)	2.20 (2.11, 2.30)
Invasive and In Situ	2.11 (2.02, 2.22)	1.90 (1.59, 2.46)	2.22 (2.13, 2.33)
Ovary[c]	1.12 (1.04, 1.23)	1.16 (0.87, 1.73)	1.34 (1.26, 1.43)
Urinary Bladder (Invasive and In Situ)	0.68 (0.60, 0.78)	0.37 (0.19, 0.88)	0.78 (0.71, 0.87)
Kidney and Renal Pelvis	0.78 (0.71, 0.87)	1.65 (1.29, 2.26)	1.39 (1.31, 1.48)
Brain and Other Nervous System	0.36 (0.32, 0.43)	0.43 (0.19, 1.00)	0.55 (0.50, 0.61)
Thyroid	1.74 (1.66, 1.83)	1.02 (0.73, 1.60)	1.51 (1.44, 1.59)
Hodgkin Lymphoma	0.10 (0.08, 0.14)	0.11 (0.03, 0.59)	0.21 (0.18, 0.25)
Non-Hodgkin Lymphoma	1.65 (1.53, 1.78)	1.18 (0.83, 1.81)	2.07 (1.97, 2.19)
Myeloma	0.42 (0.37, 0.48)	0.44 (0.28, 0.92)	0.61 (0.56, 0.68)
Leukemia	0.80 (0.73, 0.90)	0.68 (0.48, 1.17)	0.97 (0.91, 1.05)
Acute Lymphocytic Leukemia	0.10 (0.08, 0.14)	0.10 (0.05, 0.56)	0.19 (0.17, 0.22)
Chronic Lymphocytic Leukemia	0.10 (0.08, 0.14)	0.06 (0.01, 0.52)	0.21 (0.18, 0.25)
Acute Myeloid Leukemia	0.38 (0.33, 0.45)	0.34 (0.20, 0.82)	0.32 (0.28, 0.37)
Chronic Myeloid Leukemia	0.09 (0.07, 0.13)	0.09 (0.04, 0.54)	0.12 (0.10, 0.16)
Kaposi Sarcoma	0.00 (0.00, 0.04)	0.02 (0.00, 0.49)	0.03 (0.02, 0.07)
Mesothelioma	0.02 (0.01, 0.06)	0.08 (0.01, 0.55)	0.05 (0.04, 0.09)

Source: Devcan Version 6.6.1, April 2012, National Cancer Institute (http://surveillance.cancer.gov/devcan/).
SEER 18 areas (San Francisco, Connecticut, Detroit, Hawaii, Iowa, New Mexico, Seattle, Utah, Atlanta, San Jose-Monterey, Los Angeles, Alaska Native Registry, Rural Georgia, California excluding SF/SJM/LA, Kentucky, Louisiana, New Jersey, and Georgia excluding ATL/RG).

Note: Invasive cancer only unless specified otherwise.

[a] Underlying incidence data for American Indian/Alaska Native are based on the CHSDA(Contract Health Service Delivery Area) counties.

[b] Hispanic is not mutually exclusive from whites, blacks, Asian Pacific Islanders, and American Indians/Alaska Natives. Underlying incidence data for Hispanics are based on NHIA and exclude cases from the Alaska Native Registry.

[c] Ovary excludes borderline cases or histologies 8442, 8451, 8462, 8472, and 8473.

A percent or confidence interval value of 0.00 represents a value that is below 0.005.

EXHIBIT C

Comprehensive Cancer Program
Division of Prevention
"To protect and improve the health of all Ohioans"

Exposure to Toxic Chemicals and Cancer

How are we exposed to chemicals in our environment?

We come in contact with many different chemicals every day that generally do not cause health problems. But any chemical can become toxic if a person comes into contact with large enough doses. For example: aspirin will cure a headache, but too much aspirin becomes toxic and can cause serious health problems.

Contact with toxic chemicals does not always cause adverse (negative) health effects. Whether you get sick as a result of a chemical exposure depends on:

- How toxic the chemicals are;
- How much you were exposed to (**dose**);
- How long you were exposed (**duration**);
- How often you were exposed (**frequency**);
- Your **general health, age and lifestyle**. Young children, the elderly and people with chronic (ongoing) health problems are more at risk to health problems following exposures to chemicals.

What is a completed exposure pathway?

Chemicals must have a way to get into a person's body in order to cause health problems. Environmental scientists work to show the five links between a chemical source and the people who are exposed to a chemical. In order for a person to get sick from contact with chemicals, a "Completed Exposure Pathway" must be present.

The five links that make a completed exposure pathway include:

(1) **Source** (where the chemical came from);
(2) **Environmental Transport** (the way the chemical moves from the source to the public. This can take place through the soil, air, underground drinking water or surface water);
(3) **Point of Exposure** (where contact with the chemical is made. This could be where chemical contamination occurred or off-site if the contamination has moved);
(4) **Route of Exposure** (how people came into physical contact with the chemical. This could occur by drinking, eating, breathing or touching the chemical);
(5) **People Who Might be Exposed** (those who are most likely to come into physical contact with a chemical).

Documenting a completed exposure pathway:

Documenting a completed exposure pathway can link a chemical exposure with a health problem such as cancer. But it is difficult to study communities living near chemical contamination sites and link their health problems with exposure to a chemical. A few of the difficulties include:

- Not knowing the exact level of a person's exposure to a cancer-causing chemical. This is especially true if the exposure to chemicals occurred years ago and there is no information/data to prove the exposure;
- Chemical contamination sites often contain more than one chemical. This makes it difficult to link a health problem to a single exposure or chemical;
- Cancer often takes 10 to 30 years or more to develop, thus the cancer may have been caused by a completed exposure pathway that no longer exists.

Isn't the "environment" the most likely explanation for cancer clusters?

Perceptions about the role the environment in causing cancer may depend on how we define "environment." Scientists use the term "environment" a little differently from the general public. When scientists say that most cancers are "environmentally caused," they simply mean "caused by something other than heredity."

By that definition, "environmental" causes of cancer include:

- using tobacco products (cigarettes, chew, dip, snuff);
- poor diet (nutrition), lack of physical activity and obesity;
- unprotected exposure to the sun;
- risky sexual activities;
- occupational (work) exposure to chemicals.

For the general public, "environment" usually refers to pollution of cancer-causing chemicals in the air, water, or soil. It is important to note that using tobacco products, a poor diet, obesity, and lack of physical activity account for about 65% of cancer deaths, exposures to chemicals at work account for 4%, and exposure to environmental pollutants 2%.

ODH works closely with the Agency for Toxic Substance and Disease Registry (ATSDR), the U.S. EPA and Ohio EPA, local health departments and concerned communities to investigate and prevent harmful exposures and disease related to toxic substance in the environment.

A List of Known[1] and Reasonably Anticipated[2] to be Human Carcinogenic (cancer-causing) Agents by Organ		
Organ	**Known Human Carcinogen**	**Reasonably Anticipated to be Human Carcinogen**
Bladder	* Arsenic * Benzidine * Cadmium * Tobacco smoke	* Tetrachloroethylene (PERC or PCE)
Blood Diseases (leukemia, lymphoma)	* Benzene * Ionizing Radiation * Trichloroethylene (TCE) * Vinyl chloride	
Brain	* Vinyl chloride	
Colon	* Arsenic	
Kidney	* Arsenic * Coke oven emissions * Trichloroethylene (TCE)	* Tetrachloroethylene (PERC or PCE) * Chloroform
Liver	* Alcoholic drinks * Vinyl chloride * Trichloroethylene (TCE)	* Chlordane * Chloroform * Dieldrin * Polychlorinated Biphenyls (PCBs)
Lung	* Arsenic * Asbestos * Beryllium * Cadmium * Chromium (Hexavalent) * Coke oven emissions * Tobacco smoking * Uranium - Radon * Vinyl chloride	* Benzo(a)pyrene * Polycyclic aromatic hydrocarbons (PAHs)
Mouth, Pharynx, Larynx, Esophagus	* Alcoholic drinks * Chewing tobacco (mouth only) * Tobacco smoke	
Skin	* Arsenic * Overexposure to the sun	* Benzo(a)pyrene * Polycyclic aromatic hydrocarbons (PAHs) * Tetrachloroethylene (PERC or PCE)

[1] The category *"known human carcinogen"* requires evidence from human studies.

[2] The category *"reasonably anticipated to be human carcinogen"* gathers evidence mainly from animal studies. There may be limited human studies or there may be no human or animal study evidence to support carcinogenicity; but the agent, substance or mixture belongs to a well-defined class of substances that are known to be carcinogenic.

Note: Due to limited space, the above table is not a complete listing of all the known and possible human carcinogens. The top 20 chemicals listed in this table can be found in the 2011 U.S. EPA Superfund, Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) listing of chemicals found at chemical contamination sites placed on the National Priorities List (NPL).

- To see a full listing of known and possible carcinogens, you can review the National Toxicology Program, Report on Carcinogens (ROC), Twelfth Edition on-line (see below reference). **Note:** 12th ROC list TCE as reasonably anticipated to be a human carcinogen. In September 2011, U.S. EPA TCE IRIS numbers and carcinogenicity status changed to a known human carcinogen, which will likely lead to changes in the next edition of the ROC.
- To see a full listing of the chemicals found at National Priorities List (NPL) sites, you can review the 2011CERCLA Priority List of Hazardous Substances report or visit online (see below reference).

References:

- American Cancer Society, Cancer Facts & Figures, 2012 **http://www.cancer.org**
- Ohio Department of Health, Comprehensive Cancer Program, 2004.
- Agency for Toxic Substances and Disease Registry, 2011 CERCLA Priority List of Hazardous Substances (2012 electronic at **http://www.atsdr.cdc.gov/SPL/index.html**)
- Report on Carcinogens, Twelfth Edition; U.S. Department of Health and Human Services, Public Health Service, National Toxicology Program, 2011 (2012 electronic at **http://ntp.niehs.nih.gov/ntp/roc/twelfth/roc12.pdf**).

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ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

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Revised August 2012

EXHIBIT D

Childhood Cancer among Residents of Eastern Sandusky County

Ohio Department of Health
Sandusky County Health Department
and Ohio Environmental Protection Agency
Progress Report

October 30, 2009

OhioEPA

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Introduction

Background

In April 2007, the Sandusky County Health Department (SCHD) and the Ohio Department of Health (ODH) completed an analysis of cancer incidence among childhood residents (ages 0-19) of the city of Clyde and Green Creek Township, by anatomical site/type of cancer, for the years 1996-2006 and 2002-2006[1]. This assessment revealed higher than expected numbers of childhood cancers for the 11-year time period from 1996-2006 and the more recent five-year period from 2002-2006.

In December 2007, Ohio Environmental Protection Agency (Ohio EPA) was contacted by SCHD and asked to attend a meeting with the families affected by childhood cancer to aid ODH in answering questions regarding potential environmental exposures and how they relate to cancer. Ohio EPA attended this meeting in January 2008. Ohio EPA subsequently met with affected families in order to further discuss the environmental conditions in their community.

In 2008, Ohio EPA began to conduct environmental surveillance in the community, and began to conduct a detailed review of file information on historical releases, dumps/landfills and ongoing operations of area businesses. In January 2009, Ohio EPA began additional air and drinking water monitoring in the area.

During this time, ODH also conducted a spatial (geographic) analysis to identify areas of Sandusky County where clustering of childhood cancers is most likely to occur. In May 2009 ODH shared the results of the cluster analysis with the affected parents and the news media.

As the investigation continues, ODH, SCHD and Ohio EPA have continued to utilize all the data and information available to them. ODH is now conducting radiation monitoring and Ohio EPA is conducting air monitoring and a biological and water quality survey.

This joint progress report will describe these efforts and update the community on current ongoing investigations by ODH, SCHD and Ohio EPA.

[1]Cancer Incidence Among Childhood Residents of Clyde City and Green Creek Township, Sandusky County, Ohio, 1996-2006. Chronic Disease and Behavioral Epidemiology Section and the Ohio Cancer Incidence Surveillance System, Ohio Department of Health/Sandusky County Department of Public Health, April 17, 2007.

Ohio EPA file review

Background

At the request of ODH, Ohio EPA conducted an extensive file review to aid local and state health investigators in the continued study of an increased rate of juvenile cancers in the Clyde, Ohio, and Green Creek Township, Ohio, areas.

The following information from Ohio EPA documents and summarizes information available in Ohio EPA's files regarding specific local industry and waste disposal sites in Clyde, Ohio and surrounding townships. A review of files dating back to 1996 was conducted. However, in some instances information prior to 1996 is included. This information is intended to give an overview of specific local industry and waste disposal sites in and around Clyde, Ohio and may not be a comprehensive review of all potential environmental information pertaining to these specific sites.

Whirlpool Corporation, Clyde Division

The largest manufacturing facility in the Clyde area is Whirlpool Corporation, Clyde Division (Whirlpool). This facility manufactures commercial and residential washing machines. The manufacturing plant is located at 119 Birdseye St, Clyde, OH 43410. The property has been utilized for manufacturing since the late 1800s. A brief history of the property follows:

1880s: Clyde Organ Works manufactured church furniture, organs and pianos;

1894-1911: Elmore Manufacturing Company produced bicycles, one-cylinder motor buggies, folding boxes, porcelain signs and light reflectors;

1912: General Motors Corporation purchased the property. Krebs Commercial Car Co. and Clydesdale Motor Trucks Co. produced vehicles there until the early 1920s;

1923: Vitrified Iron Products Co. purchased the property from General Motors and began producing porcelain enamel products;

1934: Davidson Enamel Co. purchased the property and began manufacturing porcelain signs and refrigerator parts;

1943: Davidson Enamel changed its name to Clyde Porcelain Steel and, in addition to porcelain operations, was contracted by the Department of Defense (DoD) during World War II to produce military parts/equipment (i.e. tank doors);

1945-1947: Fire destroyed Plant 1 at the facility, which was rebuilt and expanded in 1946-1947;

1949: Bendix Home Appliance purchased the property;

1950: Avco Manufacturing Corp. purchased the property;

1952: Whirlpool leased part of the property; and

1954: Whirlpool purchased entire property from AVCO.

Air Emissions

Air emissions from Whirlpool originate from three main sources: coating operations, boiler and furnace operations (natural gas combustion), and paint burn-off ovens. Of the sources, the coating operations account for the largest source of air emissions.

The average air emissions at Whirlpool are as follows:

a. Volatile Organic Compounds (VOC's) - 250 tons per year or less;
b. Carbon Monoxide (CO) - approximately 25 tons per year;
c. Nitrous Oxide (NOx) - approximately 25 tons per year; and
d. Particulate Emissions (PE) - approximately 5 tons per year.

VOC's are the largest type of air emissions at Whirlpool. Most of the VOC's emitted are non-toxic and are not required to be reported to Ohio EPA and USEPA under the toxic release inventory program. Those that are reportable are as follows:

a. Glycol ethers - approximately 40 tons per year;
b. Xylene - approximately 10 tons per year; and
c. Ethylbenzene - approximately five tons per year.

The only other air pollutants of note are heavy metals (nickel and zinc), but their emissions are less than 25 pounds per year, each.

The emissions described above are representative of what has been emitted from Whirlpool during the last five to ten years. Beginning in the mid 1990's, paint manufacturers began producing coatings and paints that contained less VOCs. Whirlpool's Toxic Release Inventory (TRI) data can be found on the Sandusky County TRI summary data sheets for the years 1988 through 2007 in Attachment A. The TRI data reflects the lower VOC emissions from the facility due to the use of paints and coatings that contain less volatile organic solvents.

Hazardous Wastes Generated

Most of the painting conducted at Whirlpool is electro-coating with water-based paint. The primary hazardous waste stream generated during the manufacturing process is spent VOC containing solvent generated from cleaning the paint lines. The facility also generates a small amount of hazardous waste when replacing mercury containing thermostats. All hazardous wastes generated are placed in closed containers and stored in a locked room with a bermed floor and fire suspension system.

Hazardous waste generated at the facility is shipped to off-site permitted hazardous waste treatment/disposal facilities. These shipments are tracked using manifests which are required to be kept on-site for a minimum of 3 years. Ohio EPA, Division of Hazardous Waste Management (DHWM) conducts compliance evaluation inspections at the facility to assess compliance with Ohio's hazardous waste generator regulations.

Listed below are the types and amount of hazardous wastes generated by Whirlpool from 2002 to 2007:

2007 = 2900 gallons of spent solvent

48 pounds of mercury-containing waste

106 tons of cadmium and lead contaminated soil

2006 = 6943 gallons of spent solvent

69 pounds of mercury containing waste

2005 = 4425 gallons of spent solvent

29 pounds of mercury-containing waste

8 pounds of sodium cyanide

2004 = 4580 gallons of spent solvent

62 pounds of mercury-containing waste

2003 = 3202 gallons of spent solvent

2002 = 2709 gallons of spent solvent

In 1999 Whirlpool generated waste soils during construction/expansion projects. Because of the historic nature of the manufacturing site, Whirlpool hired a consultant to conduct a study of the soils prior to excavating the areas. Based on this study, Whirlpool elected to manage the soils removed as hazardous wastes. Whirlpool

managed the soils as hazardous waste for lead and cadmium. In 1999, a total of 505 tons of soil was removed and sent to Envirosafe Services of Ohio, Inc. (ESOI), Oregon, Ohio, for disposal.

Ohio EPA, Division of Emergency and Remedial Response, sent a warning letter to Whirlpool dated April 19, 2001. The letter stated that if the facility excavated in an area "where a hazardous waste or solid waste facility was operated," then Whirlpool could be in violation of ORC section 3734.02 (H) and OAC Rule 3745-27-13, which govern the investigatory activities near or in waste disposal areas. A subsequent site visit and conversations with Whirlpool clarified that the soil excavated in 1999 was not from an area in which wastes were disposed or managed; rather, Whirlpool investigated the soils prior to excavation for a construction project based on the possibility of historical deposition and the possibility of contaminants.

In 2007, Whirlpool again generated waste soils during construction/expansion projects. A total of 106 tons of soil was generated from these projects which was sent to ESOI for disposal as hazardous waste.

Spill Responses at Whirlpool Clyde

Ohio EPA has responded to one significant release from the Whirlpool Clyde Facility. In 2003, 2,700 gallons of porcelain mixed with water was accidentally released into a storm sewer which discharged into Raccoon Creek. The porcelain material consisted of silica, china clay and other types of clay. Whirlpool took responsibility for the cleanup, and there was no significant damage to the creek or environment.

Wastewaters Discharge History

The earliest documents related to wastewater in Ohio EPA files are dated 1973. These files indicate that wastewaters from Whirlpool consisted of acidic tank wastewaters, acidic rinse waters and floor and machinery washings. These wastewaters were treated using a lagoon system that involved treatment, clarification and aeration prior to the wastewater being discharged to Raccoon Creek. Sludge was periodically removed from the primary lagoon and taken to a landfill.

Beginning in 1975, Whirlpool was required by their National Pollutant Discharge Elimination System (NPDES) permit to sample for Biological Oxygen Demand (BOD_5), Total Suspended Solids (TSS), oil and grease, copper, nickel, iron, zinc, manganese, Methylene-Blue-Active Substances (MBAS), pH and flow at three outfalls. Beginning in 1977, Whirlpool began sending a portion of its wastewaters to the city of Clyde for treatment rather than discharging to Raccoon Creek.

Each time the NPDES permit was reissued, more stringent monitoring requirements and discharge limits were placed on the company. In December 1989, Whirlpool ceased the discharge of process wastewater to Raccoon Creek altogether and all wastewater effluent was diverted to the City of Clyde Wastewater Treatment Plant.

Solid Waste Disposal

Historically, Whirlpool managed their solid and sludge wastes by disposal in several area dumps. These are described below with a summary of information that Ohio EPA has obtained and has on file. Attachment B is a map showing the locations of the dumps known to be formally utilized by Whirlpool.

In the 1960s through 1970, Whirlpool generated industrial slurry from their porcelain coating process. The material was hauled in tank trucks to off-site dumps due to the high water content and significant volumes generated. Whirlpool utilized the Leach Dump site, the Golembiowski Dump site and Clyde City Dump during this time period. See the **Disposal Areas, Dumps and Landfills** section of this report for summaries of the dumps.

In 1970, Whirlpool leased the property where Golembiowski Dump was located and constructed the Amert Landfill/Disposal Site. Amert was a series of evaporation/settling ponds for the slurry/sludge mixture. Dewatering equipment at this site was operated to reduce volumes. ODH licensed the Amert disposal area.

In 1976, Whirlpool ceased using the Amert disposal site and conducted closure activities requested by Ohio EPA. Sludge was subsequently taken to County Line Landfill and Seneca East Landfill.

Clyde Paint and Supply Company

Clyde Paint and Supply Company (CPS), formerly known as Nagy Auto Body Shop, is located on approximately one acre of ground at 435 West Mulberry Street, Clyde, Ohio. CPS recycled paint sludges generated in off-site manufacturing plants from 1951 through approximately 1985. These sludges were packed in containers at the manufacturing plants and shipped to the CPS facility for processing/recycling. CPS would add xylene and/or mineral spirits to the sludge and sell the recycled paint back to the generator.

The facility utilized three underground storage tanks (USTs): one 6,000-gallon xylene UST; one 2,000-gallon mineral spirits UST; and one 3,000-gallon butyl alcohol UST. The mineral spirits and butyl alcohol USTs, located inside the building underneath the container storage area, were pumped dry and filled with concrete in 1989. The xylene

UST, located outside of the building, was pumped dry and removed from the facility in 1989.

CPS ceased operating in 1985. The last shipment of hazardous waste left the facility in 1987. A closure plan for the hazardous waste container storage area was approved on November 21, 1989. CPS requested to revise the approved closure plan due to difficulty meeting the rinseate clean standards. This revised closure plan was approved on May 3, 1990. Ohio EPA sent a letter to CPS on June 11, 1990 to acknowledge that the container storage area had been properly closed in accordance with the revised closure plan. A brief history of the property follows:

1951: CPS operations were moved to 435 West Mulberry St. in Clyde, Ohio. The initial site of operations is unknown.

1985: CPS ceased operations in December.

1987: Hazardous wastes were removed from the property. Waste included chromium, lead and ignitable hazardous wastes.

1988: CPS submitted a closure plan for the hazardous waste storage area.

1989: Ohio EPA approved the closure plan.

1990: Ohio EPA approved the revised closure plan.

1990: Ohio EPA acknowledges completion of hazardous waste closure activities.

Vickery Environmental, Incorporated

Facility Overview

Vickery Environmental, Incorporated (VEI) is a commercial facility that uses deep well injection technology to dispose of liquid industrial and hazardous wastes generated off site. VEI operates four class I hazardous underground injection wells for the disposal of liquid industrial and hazardous wastes. The facility is located on S. R. 412, near the Ohio Turnpike, approximately four (4) miles north of Clyde. VEI is a permitted commercial hazardous waste facility that can accept many types of hazardous and non-hazardous aqueous wastewater from industrial operations.

VEI receives liquid wastes by bulk tanker truck and totes. All waste streams shipped to the facility are pre-approved by VEI through a waste profile process to assure incoming waste is acceptable for disposal at VEI. Incoming loads are inspected by VEI upon receipt. The load is weighed and sampled. The samples are analyzed in VEI's on-site lab to verify that contents match the waste profile on the shipping manifest. After analysis, loads are unloaded and waste is placed in one of the storage tanks. Waste is

transferred from the storage tanks to the filter buildings and then to one of the wells for injection. Generally, the site accepts waste from 7 a.m. to 7 p.m., Monday through Saturday. At least one VEI employee is on site at all times to monitor the control room, computers and alarms.

Facility History

The site began operations in 1958 under the name Don's Oil Service. In 1970, Don's Oil Service changed its name to Ohio Liquid Disposal (OLD). In 1978, OLD was purchased by Chemical Waste Management (a wholly owned subsidiary of Waste Management, Inc.) In 1998, Chemical Waste Management changed its name to Waste Management of Ohio-Vickery. In 2000, the facility changed its name to Vickery Environmental, Incorporated.

The facility began operation as an oil recovery service to provide waste oil hauling from neighboring industries to a central facility for recovery and eventual resale. As time went on, the facility started to accept various industrial wastes and stored them in surface impoundments. In 1964, the operators were granted permission by the State of Ohio to accept chemical process waste and more surface impoundments were constructed. By the late 1960's, the amount of industrial waste received at the facility exceeded the used oil volumes. This created a waste storage issue due to the capacity of the surface impoundments. In 1972, OLD was granted permission to drill a test hole to evaluate the subsurface conditions for the possible location of an injection well. Deep well injection activities at the site were initiated in 1976 by OLD. VEI, successor to Chemical Waste Management, Inc. and Waste Management of Ohio-Vickery, acquired the Vickery, Ohio, facility from OLD in 1978, and has operated the injection wells since that time. Seven injection wells were drilled on-site throughout the history of the facility (Injection Wells 1, 1A, 2, 3, 4, 5 and 6). The subsurface conditions are noted in key geologic formations and their role in the containment process for underground injection include:

- Injection Interval – the zone that is permitted to directly receive injected waste (Mt. Simon sandstone approximately 2800' to 2950');
- Containment Interval – no fluid may be directly injected into this interval, but the injected fluid may move into this interval. (Knox, Kerbel, Conasauga and Rome formations, approximately 2350' to 2800'). These formations serve to arrest potential vertical movement because of their reduced porosity, compared to the injection interval, and sandstone lenses that serve as pressure "bleed-off" zones (reducing any potential upward driving force);
- Injection Zone – the Injection and Containment intervals combined (2350' to 2950');
- Confining Zone – an additional layer of geologic protection that further inhibits any potential fluid or pressure migration as the result of reduced porosity and

- Lowermost underground source of drinking water (USDW). At Vickery, the Brassfield Formation represents the lowermost USDW is approximately 740' below ground level. This is approximately 2060' above the top of the Injection Interval, approximately 1600' above the top of the Containment Interval and 1060' above the top of the Confining Zone.

During the history of the facility, 12 surface impoundments existed. These surface impoundments were constructed from 1964 through 1975. As waste injection began, the surface impoundments were closed, and from 1979 to 1992 all of the surface impoundments were closed. In the 1970's and early 1980's, several of the injection wells experienced problems due to their design and construction. It was estimated that approximately 45 to 60 million gallons of waste was injected into the containment interval. This interval may receive indirect waste movement but the injection permits specify that waste must be injected into the injection interval (Mt. Simon) only.

Injection Wells 1, 1A and 3 were plugged and abandoned due to mechanical and physical failures. (Injection Well 1 was plugged in July 1980. Well 1A was plugged in November 1987 and Well 3 was plugged in July 1987.) Wells 2, 4 and 5 were recompleted using a combination of liners, resistant cement and fibercast tubing. Well 6 was plugged back and re-drilled (side tracked). This well also incorporated a liner, resistant cement and fibercast tubing. The recompletion work on the injection wells lasted 2-3 years: Well 2: September 1983 – January 1985; Well 4: November 1983 – January 1984; Well 5: November 1983 – June 1984; Well 6: September 1983 – August 1984.

Presently, Injection Wells 2, 4, 5 and 6 are active on-site. These injection wells are regulated under four Underground Injection Control (UIC) permits which were issued on July 16, 2008. Since the reconstruction of the injection wells, testing and data confirm that all waste has been injected into the injection interval. A study conducted by Underground Resource Management, under contract for Ohio EPA, concluded that the site offered a very low risk of environmental problems.

In 1984, an action by the Ohio Attorney General in the form of a Consent Decree against Waste Management was taken due to nuisance conditions and a threat to the environment caused by the surface impoundments. The surface impoundments were the source of odor complaints from this site. The Consent Decree required the facility, in part, to reconstruct the injection wells, close the surface impoundments and create an on-site closure cell in accordance with applicable regulations. CWM-Vickery was granted approval to construct a Toxic Substances Control Act (TSCA) closure cell to dispose of the wastes generated from the closure of the surface impoundments. The closure cell was built between 1986 and 1988 and the waste from the surface

impoundments was moved into the closure cell in 1990.

A Citizens Public Information Committee was organized under the Consent Decree to provide oversight of the facility. Over the past twenty-five (25) years, the Public Information Committee has met regularly to review operations of the disposal facility. It is chaired by the Sandusky County Health Commissioner and consists of members of the community, Sandusky County Board of Health and the Ohio EPA.

A Sandusky County Common Pleas Judge terminated the Consent Decree that created the committee on July 9, 1997. This Court action automatically put into place a new Public Information Committee Agreement that had been worked on and agreed to by the Ohio EPA Director, Waste Management of Ohio-Vickery, the existing Committee and the Sandusky County Board of Health. The committee adopted a set of bylaws in 1998 to guide its meetings and deliberations.

On-Site Inspector Responsibilities

Ohio EPA employs an on-site inspector who is stationed at VEI. Responsibilities for this inspector include site inspections three to five times per week; review of all new and amended waste profiles; daily review of shipping manifests; semi-annual compliance evaluation inspection; permit reviews and modifications; oversight of corrective action-related field work; attend bi-monthly citizen committee meetings; and provide technical support to facility as requested.

Acceptable Waste Streams

Vickery can accept nearly all types of hazardous and non-hazardous aqueous wastewater from industrial operations. Examples of acceptable and unacceptable waste streams are listed below:

<u>Acceptable Waste Streams</u>
Aqueous Wastewaters - Hazardous or Non-Hazardous
Acid Wastewaters
Acids - Acetic, Chromic, Hydrochloric, Nitric, Phosphoric, Sulfuric
Airport De-icing Fluids
Ammonia Wastewater
Brines and Salt Solutions
Caustic/Alkaline Wastewaters
Chemical Manufacturing Wastewaters
Contaminated Groundwater
Galvanizing Solutions
Landfill Leachate
Metal Plating Solutions and Wastewaters
Waste Pickle Liquor

Unacceptable Waste Streams
F-listed Dioxin Wastes
Medical Waste
Radioactive Waste
Releasable Cyanide greater than or equal to 250 ppm
Releasable Sulfide greater than or equal to 500 ppm
TSCA Waste (i.e., PCBs) Unacceptable Wastes
Waste with Flashpoint less than 212 F
Waste with Oil greater than or equal to 10%
Waste with Solvents greater than or equal to 5%

Investigation and clean-up activities

As a regulated hazardous waste treatment, storage and disposal facility, VEI is required to investigate whether waste management practices at the facility have adversely affected the environment. This process is governed by Ohio EPA and U.S. EPA under corrective action authority of the Resource Conservation and Recovery Act (RCRA). Corrective action may be thought of as a facility-wide assessment of potential impacts to human health and the environment. A work plan was developed for 53 waste management units (WMUs) and ten Areas of Concern (AOCs).

Between January 2002 and June 2003, VEI submitted documentation demonstrating two milestones had been meet, which are the “Current Human Exposure Under Control” and the “Migration of Contaminated Groundwater Under Control.” This means the investigation has revealed that there is no unacceptable human exposure to contamination that can be reasonably suspected under current land and groundwater use conditions. It also means that no ground water contamination has left the site and monitoring will continue to assure that no contaminants move from the site. Ohio EPA judged these two documents as acceptable in May 2004.

VEI submitted a RCRA Facility Investigation Report to Ohio EPA on August 21, 2009. This report is a comprehensive summary of all Phase I and Phase II activities. Ohio EPA is currently reviewing this report.

Sanitary wastewater treatment

Since January 11, 1988, sanitary wastewater effluent from the on-site package treatment plant has been disposed of on site through the deep well disposal system. In November 2005, a Permit-to-Install was issued for a sanitary wastewater trash trap and storage tank. The installation of these tanks replaced the on-site package treatment plant. The sanitary wastewater continues to be disposed of on site through the deep well disposal system.

Air Emissions

Air emissions from the daily operations at VEI are regulated as a minor source of pollutants by Ohio EPA. However, VEI has had plant upsets which have caused visible air releases. In response to air releases, Ohio EPA requested VEI to conduct a stack test, which was witnessed by Ohio EPA staff on May 30, 2007. Results of the stack test for the hazardous waste receiving and treatment injection system (P001) showed the following measurable air emissions:

Pollutant	Actual Emission Rate*	Allowable Emission Rate	Source Operating Rate*	Maximum Source Operating Rate
Hydrochloric Acid	0.00501 lbs/hr	0.60 lbs/hr	287.7 gpm	319.6 gpm
Nitric Acid	0.00506 lbs/hr	3.0 lbs/hr	287.7 gpm	319.6 gpm
Sulfuric Acid	7.04×10^{-4} lbs/hr	0.10 lbs/hr	287.7 gpm	319.6 gpm
VOC	0.33 lbs/hr as propane	5.0 lbs/hr	287.7 gpm	319.6 gpm

* Average of test runs 1 and 2.

The current NOx allowable emission rate is 91.47 lbs/hr. This emission rate is to account for upset conditions in the tanks that are vented to the scrubber that controls P001. Upset conditions are limited to 240 hours per year.

Releases, Spill Responses and Compliance at VEI

Air Releases

Over the years, the facility has had plant upsets which have caused visible air releases. The Ohio EPA Emergency Response Unit has responded to two air releases at VEI, one in 2003 and the other in 2006. Both incidents originated from the same source at the facility, and resulted in air releases reported to be nitrogen dioxide/nitric oxide/nitrous gas, visible as a red cloud. Specifically, the gas was released due to a chemical reaction that occurred in a 200,000-gallon above-ground storage tank. As the reaction progressed within the tank, a buildup of pressure caused it to vent through a pressure relief valve.

In August 2003, the release drifted in the direction of the Ohio Turnpike. No evacuations were performed, and both the U. S. EPA and Ohio EPA conducted air monitoring using Drager tubes. Monitoring conducted approximately 100 yards downwind of the release point revealed nitrous fumes below 0.5 ppm. This sampling was conducted approximately three hours after the discovery of the release.

In March of 2006, the release drifted toward the south. Consequently, the fire department evacuated several locations downwind as a precaution. This time the company was prepared to perform air monitoring of nitrous fumes using Drager tubes. Their results, obtained approximately 30 minutes after discovery of the release, showed no detection at the fence line of the facility. This release was visible in Clyde.

Releases of nitrogen oxides can be very visible; however, they typically breakdown very rapidly in the atmosphere. They are not classified as potential carcinogens. Levels that are immediately dangerous exceed 100 ppm and would typically cause irritation to eyes, nose and lungs. Shortness of breath, nausea and fluid in the lungs can also occur when exposed to low levels for several days or higher levels. The Occupational Safety and Health Administration (OSHA) limit of nitric oxide permitted in the workplace for an 8 hour day is 25 ppm. .

Surface Water Releases

The Ohio EPA Emergency Response Unit has responded to two surface water releases from VEI, one in 1993 and the other in 2003. In both incidences, above-ground pipeline failed causing the release of waste acid to Little Raccoon Creek.

On April 22, 1993, an above ground pipeline broke causing the release of an estimated 500 to 800 gallons of waste acid. The spilled waste migrated down Meyers ditch and into Little Raccoon Creek. As the waste acid neutralized it formed an orange residue. Upon discovery of this release, the surface water management gate that leads to Meyers ditch was closed and the leaking pipeline line was vacuumed. Surface water flowing onto the site from Meyers ditch was diverted by pumping the water to Little Raccoon Creek on the South side of Route 412. Contaminated water and soil generated from the clean up of the release was managed as hazardous waste.

On February 22, 2003, an above-ground pipeline broke resulting in a release of waste acid that made its way to storm water management gate C-4 and Meyers Ditch before being discovered. Due to the rainfall and despite containment efforts, the spill made its way to Meyers Ditch and Little Raccoon Creek. Constituents with the highest concentrations were chromium, iron, lead and nickel. Roughly 70,673 gallons of contaminated storm water was collected and disposed via deep well injection. Due to the continuous rainfall vacuum trucks could not keep up with the additional storm water that was starting to bypass the Meyers Ditch storm water management gate. Eventually the main gate valve to Little Raccoon Creek had to be opened to prevent a blowout of the gate valve.

Contaminated soil could not be removed until weather conditions improved. In late March 2003, several inches of soil were removed from the affected area and surrounding areas that may have been affected by clean-up activities. Verification

sampling determined that additional soil removal was necessary. After the next round of excavation and removal activities, only one location exceeded risk-based concentrations for residential soil. That exceedance was located onsite and was later excavated, re-sampled and found to be below risk-based concentrations.

Underground Injection Control Summary

VEI currently operates four Class I hazardous underground injection wells. The Ground Water Protection Council describes Class I wells as technologically sophisticated wells which inject larger volumes of hazardous and/or non-hazardous wastes into deep saline formations. These wells are separated from the lowermost underground source of drinking water by layers of impermeable rock.

Examples of the waste fluids may include spent pickle liquor (acids) from iron and steel production facilities, recycling operations process water, incinerator scrubber water and leachate recovered from other solid waste facilities, as well as on-site-generated leachate and storm water. Some of these liquid wastes are considered hazardous because they are listed hazardous waste and/or the waste exhibits one or more hazardous waste characteristics.

Underground Injection

The waste at VEI is injected into the Mt. Simon Sandstone between approximately 2,800 feet and 2925 feet below ground level. The Mt. Simon injection zone is separated from the lowermost underground source of drinking water by approximately 1,600 feet of shales, limestones, dolomites, siltstones and sandstones.

VEI's Injection Wells 2, 5, and 6 are used to inject acidic wastes whereas Well 4 is currently used to inject an alkaline waste stream. Wells 1, 1A, and 3 have been plugged and abandoned. Through September 2008, the total volume injected at the site, including fluids injected into the closed wells, is approximately 1.47 billion gallons. During the last decade, injected waste volumes typically range between 30 to 40 million gallons annually.

Class I Permit Requirements

To demonstrate that a well has mechanical integrity and to ensure that it is being operated safely within the required parameters, VEI must satisfy the following permit conditions:

- Each well is required to be tested annually for mechanical integrity. The mechanical integrity test (MIT) is used to demonstrate that the tubing/packer assembly is intact and has no leaks, and that the injected fluids are properly contained within the permitted intervals;

- An annual pressure build-up and fall-off test provides an estimate of the injection interval pressure increase and response. This information is used to verify the "No Migration" demonstration model;
- Automatic warning and shut down tests are conducted annually to demonstrate that VEI's operating system will automatically shutdown if operational parameters exceed the protective set points. The set points are set so that critical geologic parameters are not exceeded.
- Monthly and quarterly operating reports are required to demonstrate that the continuously recorded well data and operating systems are within the required operating parameters; and,
- Ohio EPA, Underground Injection Control (UIC) inspections to verify the reported information. The most recent annual UIC compliance inspection was March 31, 2009. Semi-annual inspections in 2008 were conducted on June 6 and November 3.

Monitoring, Measurement and Verification

Class I hazardous waste wells are required to satisfy both federal and state requirements to ensure the protection of the lowermost underground source of drinking water. Construction requirements for the wells include multiple layers of protection, including:

- Cement/conductor-surface casing;
- Cement/protection casing;
- Tubing/packer assembly/annulus; and,
- Continuous monitoring of the injection system.

An additional layer of protection at Vickery is provided by the shallow and deep monitoring wells. The deep monitoring well, located in the Knox-Kerbel interval, allows Ohio EPA to monitor conditions within the injection zone.

Clyde and Green Creek Disposal Areas, Dumps and Landfills

This section summarizes Ohio EPA's information on old disposal areas, dumps and landfills used to dispose of residential and manufacturing waste in the Clyde and Green Creek Township area. Some of Ohio EPA's files on these sites are extensive. However, there are a few sites about which little is known.

Clyde is not unlike many communities across Ohio where smaller refuse dumps were operated before environmental regulations existed. In most instances, Ohio EPA evaluates what is known about the dumps to determine if there may be human health or environmental impacts occurring. Ohio EPA prioritizes attention to these dumps based on their proximity to residential areas and drinking water supplies, and the likelihood for the population to be exposed to harmful contaminants. The two most likely routes of exposure to contaminants that may be in waste disposal areas are ingestion of

contaminated drinking water from a leaking dump or vapor intrusion of volatile chemicals into inhabited structures, primarily those with basements.

As indicated earlier in this report, Whirlpool utilized the Clyde City Dump, the Leach Dump Site, the Golembioski Dump Site and the Amert Lagoon Site to dispose of industrial wastes generated at the facility.

Each dump site is summarized below and is identified by location or the name to which it is most commonly referred in Ohio EPA's files. Attachment C is a map indicating the locations of the known disposal areas. Some disposal areas are not shown on the map because their exact location is unknown.

Clyde City Dump

The site contains approximately 11 acres, and is located north of McPhearson Highway (Route 20), just north of the Clyde City Water Pollution Control facility. No permits or licenses to operate were ever issued by the local health department or ODH.

Residential, commercial and industrial wastes were disposed of from the early 1930s through 1969. Wastes were routinely burned and included general refuse, appliances and parts, industrial sludges, wastewater sludges, waste paint and enamel sludges, thinners and solvents, waste oils, plastics and auto parts. The primary industrial users were Whirlpool and its predecessor companies and CPS.

Historically, leachate sampled from the site in the late 1990's contained organic and inorganic contaminants at relatively low concentrations. Soils at the dump contain elevated concentrations of metals and organic contaminants, some of which exceed residential preliminary remediation goals (PRGs). Residential PRGs are very conservative risk based screening values for soils that are protective of human health based on typical homeowner exposure to soil. Exposure routes include direct contact with recreational users of Raccoon Creek and trespassers at the dump.

In 2005, the city of Clyde was authorized by Ohio EPA to conduct voluntary improvements to the dump site. These improvements primarily involved the additional placement of soil on the cap and modifications to existing storm water controls to further minimize the potential for human health and ecological impacts from the dump site. Cap and storm water modifications made at the site minimize the generation of leachate and reduce the possibility of exposure to site contaminants.

Leach Dump Site

This site operated in the 1950s through 1968. The site is located west side of County Road 236 (Spayd Road aka Sherman Rd.) The exact fill boundary and acreage is unknown, but is estimated to be approximately two to three acres in size.

The dump contains general refuse by local haulers and Whirlpool's porcelain sludge.

In late 2001 and early 2002 Whirlpool conducted a voluntary soil removal action. Sampling and analysis was performed at the site prior to the removal project with waste being characterized and delineated for the extent of the material.

There were 33 soil borings conducted prior to the project, and 31 verification soil samples taken subsequent to the removal action to assure completeness. Transportation was conducted in accordance with a Hauling Plan submitted and approved by Green Creek Township Trustees and Sandusky County Engineers Office. The trucks were also fully covered (tarped) prior to leaving the site.

Wastes (2,570 loads estimated at 60,000 tons) were non-hazardous (contained mostly metals and petroleum). Disposal was at BFI landfill in Ottawa County. The project removed a total of 31,720 tons of soil, approximately 1,330 truck loads.

Completion of the project included bringing in clean back-fill and grading to natural conditions as best as possible.

Golembiowski Dump Site

This site operated in the 1950s through 1968 on land owned by Amert. Golembiowski was a local hauler who leased the land and operated the site.

General refuse from the Clyde area was disposed of at the site by local haulers. Whirlpool disposed of sludges for a very short period (two- to three-months) at this site just before the dump closed. The estimated total of sludges disposed during this time by Whirlpool was four million gallons.

The fill area is approximately eight acres in size and is located on the north side of County Road 185, just west of West Maple Street. It is unknown whether the fill area was capped upon closing. Historical records note the area was marshy and wet, either due to a high water table or poor drainage. This site is located immediately south of the Amert Lagoon Site and is currently owned by Whirlpool. According to Whirlpool, a voluntary removal action of wastes was conducted at this site during the same time period of the removal action at the Leach Dump site. No backfill was brought in to areas where wastes were removed.

Amert Lagoon Site

This site was constructed and operated by Whirlpool from 1970 to 1976, and is located on the north side of County Road 185, just west of the intersection with Maple Street. Green Creek Township. The site is now owned by Whirlpool and is located immediately north of the Golembiowski Dump.

The site contains metal finishing wastes and porcelain slurry/sludges. The site was licensed by ODH. The facility contained shallow unlined lagoons five-foot deep and covering an area of approximately four acres.

Vegetation distress adjacent to the lagoons was noticed in 1975 due to runoff and possibly shallow ground water movement. Sampling was conducted that indicated Boron as a contaminant of concern causing toxicity to plants.

The dump was capped with one foot of clay and six inches of topsoil in 1977. A groundwater interceptor trench was installed on the south and east sides of landfill. The site drains to an unnamed tributary of Raccoon Creek.

Sampling was conducted from landfill wastes (nine samples from three borings), domestic wells and monitoring wells (27 samples from 12 wells), surface water (three samples), and shallow soils (43 samples). Note all soil samples taken meet today's residential VAP standards. The waste samples all meet industrial VAP standards. Some metals and trace elements above method detection limits were noted.

A hydrogeologic study was conducted by Whirlpool's consultant in the 1980s and a report was issued in 1990. Boron, a trace mineral and essential nutrient, was a primary contaminant of concern. Because boron is nonhazardous and nontoxic in elemental form, the site was given a low priority for further action.

Unknown Name (Possibly Green Creek Township Dump or Warnecke Dump)

This site is located on the east side of State Route 101 north of Portland Road and south of the Norfolk Southern Railroad. The fill area is estimated to be approximately 2 acres based on aerial photographs. No other information is available.

Meggitt Landfill

The exact location of this site is unknown. File documentation indicates the location to be somewhere on County Road 198 near the Village of Green Springs. County Road 198 forms the western boundary of Green Creek Township. Wastes disposed of were likely general refuse from township residents. No other file information could be located.

Formulated Products Site

This drum site was located on a 2.5 acre parcel in a predominantly residential area. The address at the time was 110 East Street, just east of the downtown district in the City of Clyde. This was the site of a USEPA drum removal action in 1998. Drums contained corrosives, oxidizers, flammables, and waste oils. PCB capacitors, sludge from a pit, and other small containers of material were also removed from the building and the concrete floor was decontaminated. PCB contaminants have the potential to cause both carcinogenic and non carcinogenic health effects in humans based on health studies. Conditions of soil and ground water have not been characterized. The building has been razed and is a vacant lot. Additional information regarding the drum removal action is available through USEPA.

Wickerham Drum Site

This drum site was located in the front yard of a residence at 853 North Main Street. Eighteen drums were used to fill in a low area. The drum contents were dried paint wastes suspected to be from CPS. Two of the drums were characteristically hazardous for chrome, lead, and flashpoint. Mr. Wickerham was previously employed by CPS as a foreman. The drums and associated contaminated soils were removed in 1998 by Mr. Wickerham and the City of Clyde in a joint private voluntary removal action. The removal was overseen by Ohio EPA.

Whirlpool Manufacturing Site

The manufacturing site is located south of McPhearson Highway (Route 20), just south of the Clyde City Fire Station and the Clyde City Water Pollution Control facility. Whirlpool had at least one onsite treatment lagoon and a couple small dump sites on the property that were established by previous owners. The treatment lagoon generated porcelain slurry that was disposed of at the Amert site, Golembiowski site, Leach site, and to a lesser extent Clyde City Dump. At one time, this lagoon discharged directly to Raccoon Creek through a permitted outfall, but now it discharges to the city's sanitary sewer. The treatment lagoon is located on the south side of the site on the west side of Raccoon Creek. Portions of Raccoon Creek have since been tiled on the site.

McGrath Dump

This site is located on the north side of County Road 231 (Stokes Road) behind the residence at address 3954. The fill area is approximately 9 acres containing industrial solid and liquid wastes in addition to some residential waste. The site operated from 1965 through 1968. The last known owner was Don Hedrick. No other information could be located.

Riley Township Dump

The exact location of this dump site is unknown. File documentation reports the location to be somewhere on County Road 232. Wastes disposed of were likely general refuse from township residents. No other information could be located.

Bellevue City Dump

This site is located on the northeast and southeast corners of the intersection of County Road 308 and County Road 113 on the southwest side of town. General refuse and possibly some industrial wastes from the Bellevue area were deposited at this site. No other information could be located.

York Township Dump

The exact location of this dump site is unknown. File documentation reports the location to be somewhere on County Road 205. Wastes disposed of were likely general refuse from township residents. No other information could be located.

Townsend Township Dump

The exact location of this dump site is unknown. File documentation reports the location to be somewhere near the Village of Vickery. Wastes disposed of were likely general refuse from township and village residents. No other information could be located.

ODH, SCHD and Ohio EPA Completed Assessments

Background

ODH has completed the following assessments: Cancer Incidence among Childhood Residents of Clyde City and Green Creek Township, 1996-2006, Clyde City and Green Creek Township area Childhood Cancer Case Review, Consultations with Case Families Regarding Environmental Issues, HAS Review of Public and Private Sources of Drinking Water, and a Cluster Analysis. Ohio EPA has completed the assessment on drinking water sources. Explanations on the completed assessments follow:

ODH

Cancer Incidence among Childhood Residents of Clyde City and Green Creek Township, 1996-2006

ODH and SCHD responded to concerns of residents from Clyde City and Green Creek Township regarding a perceived high rate of cancer among residents 19 years and younger.[2] A review of population-based cancer incidence data from the Ohio Cancer Surveillance System for the years 1996-2006 revealed 36 new cases of cancer among Sandusky County residents 19 years and younger. These 36 cases for all of Sandusky County did not differ significantly from the 34 cases expected based on national background cancer incidence rates.
An assessment of cancer among residents of Clyde City and Green Creek Township, age 19 years and younger, found 10 new cases of cancer when only 5.32 would be expected based on national background cancer incidence rates. For the more recent years of 2002-2006, there were eight new cases in this population when only 2.47

[2] *Cancer Incidence among Childhood Residents of Clyde City and Green Creek Township, Sandusky County, Ohio, 1996-2006. Chronic Disease and Behavioral Epidemiology Section and the Ohio Cancer Incidence Surveillance System, Ohio Department of Health and the Sandusky County Department of Public Health, Final Report, April 17, 2007.*

would be expected. These data analyses indicate that cancer may be occurring in the population age 19 years and younger at a higher than expected rate in the city of Clyde and Green Creek Township area.

Brain and other central nervous cancer was found to be the most common among the Clyde City and Green Creek Township childhood population with four cases, and was significantly higher at pl0.05 than the <1 case expected based on national background. The other six cases in Clyde City and Green Creek Township consists of one case each of Ewings Sarcoma (soft tissue), Hodgkins Lymphoma, Leukemia, Osteosarcoma (bone), rhabdomyosarcoma, and cancer of the testis.

During 2007 there were no known new cases of cancer, but in late 2008 there were two additional cases.

Clyde City and Green Creek Township area Childhood Cancer Case Review

ODH worked with SCHD to conduct a "case-review" to attempt to find factors that may have played a role in the case's personal environment or behaviors that may have played a role.[3] The case-review was conducted by SCHD staff using a standardized questionnaire developed by ODH. The questionnaire gathered information concerning potential exposures to the child during fetal development; medical history; potential exposure in the home environment to chemicals, pesticides, tobacco smoke, etc., parental occupations; drinking water sources; school attendance; history of cancer in the family; and other information to attempt to identify factors that may have played a role in the development of these cancers.

The case-review did not reveal any common or individual factors that may have played a role in these cancers.

Consultations with Case Families Regarding Environmental Issues

In January, 2008, the Health Assessment Section (HAS) of the ODH Bureau of Environmental Health joined Ohio EPA, Northwest District Office Staff in a meeting with case-families to attempt to address whether environmental factors may have played a role in the development of these cancers. The meeting was held at SCHD.

During the meeting the case families expressed concerns regarding potential exposures from area manufacturing facilities, several local landfills, and a toxic waste deep-well injection site.

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[3] *Clyde City and Green Creek Township area Childhood Cancer Case Review, 1996-2006. Chronic Disease and Behavioral Epidemiology Section, Ohio Department of Health and the Sandusky County Department of Public Health. Final Report, February 29, 2008.*

The HAS presented and discussed information regarding the concept of a completed pathway of exposure and how chemicals must get into a persons body, and in sufficient quantity, in order to result in a health problem. The HAS discussed five links that make a completed exposure pathway: (a) Source [where the chemical came from]; (b) Environmental transport [the way the chemical moves from the source to the person, e.g. air, water]; (c) Point of exposure [where contact wit the chemical is made. This may be where the chemical contamination occurred or off-site if the contamination has moved]; (d) Route of exposure [how a person comes into physical contact with the chemical e.g. drinking, eating, breathing]; and (e) Persons who might be exposed [those who are most likely to come into physical contact with the chemical].

HAS Review of Public and Private Sources of Drinking Water

An HAS review of the public and private sources of drinking water used by the case families indicated three different sources of drinking water: (a) The City of Clyde public water supply [Surface impoundment of Raccoon Creek Surface water]. This source is regularly monitored by the Ohio EPA under the authority of the federal Safe Drinking Water Act; (b) The Ohio Northern Rural Water Public Water Supply [Lake Erie Surface Waters] of which is also regularly monitored by the Ohio EPA; and (c) Area private wells [using the underlying bedrock aquifer system].

The diversity of the water supplies being used by the case families, coupled with the required monitoring of public water supplies, and a lack of any historical record of significant chemical contaminants being detected in these water supplies, led the HAS to the opinion that it is unlikely that drinking water contaminants played a role in the development of these cancers.

Cluster Analysis

As a follow-up to the epidemiologic assessment and the case review, ODH in partnership with the Comprehensive Cancer Control and James Cancer Hospital and Solove Research Institute at the Ohio State University, conducted a spatial (geographic) analysis to identify areas of Sandusky County where clustering of childhood cancers is most likely to occur.[4]

The goal of the spatial analysis was to determine whether or not there was clustering of invasive cancers among children residing in Sandusky County during the years 1996-2006. There were two primary objectives for this analysis: (a) To determine the geographic regions in Sandusky County and the surrounding area where the most likely

[4] Investigation of Potential Clustering of Invasive Cancer among Children, Adolescents, and Young Adults in Sandusky County, Ohio, 1996-2006. Ohio Cancer Incidence Surveillance System/Comprehensive Cancer Control Program. Ohio Department of Health and the Comprehensive Cancer Control and James Cancer Hospital and Solove Research Institute at the Ohio State University, May 28, 2009.

clustering of cancers among children has occurred; and, (b) To determine the probability (p-value), or likelihood, that the cluster occurred by chance. A p-value of less than 0.05 was considered statistically significant.

Cases were defined as children age 0-19 years diagnosed with invasive cancer during 1996-2006 while a resident of two geographic regions: (a) Sandusky County [36 cases]; and (b) Sandusky County and surrounding area, which included Ottawa and Seneca Counties and portions of Erie, Hancock, Huron, Lucas, Wood, and Wyandot Counties [277 cases]. Cases were identified through the population-based cancer files and the Ohio Cancer Incidence Surveillance System at the ODH.

The data were analyzed using SatScan, a software program that scans for high rates, (clusters). SatScan identifies the most likely clusters in a defined geographic area. A p-value is calculated for each cluster to determine the probability that the cluster occurred by chance.

Census tracts were selected as the geographic unit of analysis in SatScan. Cancer cases were aggregated to a geographic point in the census tract (the “centroid”) in two ways: (a) As the geographic center of the census tract; and (b) As the weighted center of the population within the census tract. Thus there were four separate analyses: (a) Sandusky County using the geographic center of the census tract; (b) Sandusky County using the weighted center of the population within the census tract; (c) Sandusky County and region using the geographic center of the census tracts; and (d) Sandusky County and region using the weighted population centers of the census tracts.

The results from the analysis indicate that for Sandusky County the most likely cluster occurred in the eastern portion of Sandusky County. This cluster had a radius of between 5 to 7 miles and a p-value of less than 0.05, indicating statistical significance, i.e., this clustering could have occurred by chance alone less than five times out of a hundred. The Sandusky County and region analysis indicated that the most likely cluster occurred in the northeastern portion of Sandusky County, extending into Southeastern Ottawa County and Northeastern portion of Sandusky County, extending into Southeastern Ottawa County and Northwestern Erie County. This cluster had a radius of about 7 miles and a p-value greater than 0.05, indicating no statistical significance, i.e., the cluster could have occurred by chance alone more than five times out of a hundred.

The results of the cluster analysis were shared with the affected parents and the news media in May 2009.

SCHD

In addition to those collaborative activities acknowledge by the other agencies, SCHD has maintained communication with the case families, disseminating information from the agencies involved in the investigation. Since the existence of the study, SCHD has received questions and concerns via correspondence from numerous individuals in the

community and the region. SCHD staff has acted upon each of these advisements themselves or by referring to the appropriate agency. Local historical data has been reviewed and incorporated into the study investigation by both the Nursing and Environmental health Divisions of SCHD.

Ohio EPA

Drinking Water

Drinking water sampling was conducted in January and February of 2009. Eleven drinking water samples were collected from two public water systems and domestic water wells. The samples were analyzed for a broad scan of carcinogenic and non carcinogenic chemical compounds. Results of the sampling did not identify any components of drinking water that suggest carcinogenic health concerns. Additional sampling of drinking water was conducted in June 2009. Nine water samples were collected for analysis of pesticides. Samples were obtained from public water systems, domestic wells, reservoirs and a river intake. The analytical results are consistent with the previous drinking water quality results with the detection of low level concentrations of commonly used pesticides in water which is derived from a stream or reservoir. No results from a treated drinking water sample exceeded a maximum contaminant health level standard. No pesticides were detected in any of the domestic water well samples or the Northern Ohio Rural Water sample.

ODH, SCHD and Ohio EPA Current Initiatives

Background

ODH is working with SCHD on three follow-up initiatives to be completed in 2009: (a) a survey for ionizing radiation; (b) an assessment of adverse reproduction outcomes, i.e. fetal deaths, low birth weight, infant death, and congenital anomalies; and (c) administration of a follow-up childhood cancer risk factors questionnaire with a greater emphasis on environmental factors.

Ohio EPA's role in this ongoing investigation is to assist local and state health partners to identify potential sources of past or current contamination to which the residents of Clyde may have been exposed. Ohio EPA is currently conducting investigations in an effort to identify unexpected environmental exposure including air monitoring. Additional investigations may be conducted by Ohio EPA as new information becomes available or in response to requests from local or state health partners.

The following information highlights the ongoing initiatives by ODH, SCHD and Ohio EPA.

ODH

a. Survey for Ionizing Radiation

In June, 2009 the Comprehensive Cancer Control Program at ODH discussed the Sandusky County Childhood Cancer analyses completed to data with the ODH Bureau of Radiation Protection (BRP). The Comprehensive Cancer Control Program requested the BRP to address the issue of potential sources of ionizing radiation in the area. In response the BRP has undertaken six initiatives:

1. *Historical Radioactive Material User Records Search Project* Staff in the Technical Support Section of the BRP are performing a search of available records looking for any indication that radioactive material may have been used in the surrounding area:
    a. During the Manhattan Engineering District era;
    b. By an Atomic Energy Commission contractor;
    c. By a Nuclear Regulatory Commission licensee; or,
    d. Currently used by a State of Ohio radioactive materials licensee;

2. *Historical Review of Davis Besse Nuclear Power Station Environmental Radiological Air Monitoring Results.* BRP Technical Support staff are performing a historic review of the sampling and analytical results from the environmental air sampling program operated by the BRP around the Davis Besse Nuclear Power Station;

3. *Sandusky County Schools Radiological Survey Project*. Twenty public and private elementary, middle, and high schools around eastern Sandusky County were surveyed by BRP health physicists staff during the first two weeks of August, 2009;

4. *Sandusky County Cancer Case Homes Radiological Survey Project.* The BRP has developed a radiological survey plan to perform radiological monitoring of Eastern Sandusky County cancer cluster homes, along with two “control” homes for each case, i.e. homes of similar structure as the cases but without a child that had been diagnosed with cancer. The surveys will be performed without specific knowledge of the case/control status of the home. The results will be used to determine whether there are statistically significant radiological indices unique to the Eastern Sandusky County cancer case homes. In conjunction with the Radiological Survey Project, SCHD personnel will be conducting a radon study in surveyed homes to assess for potential elevations in environmental radon.

5. *Clyde City Environmental Airborne Radioactivity Sampling Project*. BRP has installed an environmental air sampler at the Waste Water Treatment Facility located in Clyde. A paper filter, designed to capture radioactive particulate, and charcoal cartridge, designed specifically for radioactive iodines, are both being

changed on a weekly basis and sent to the ODH Public Health Laboratory for analyses. The air sampling project is scheduled to run through December, 2009; and,

6. *Sandusky County Ohio EPA River/Stream Sediment Analysis for Gross Alpha and Gross Beta*. Ohio EPA collected sediment samples that were sent to the ODH Public Health Laboratory for analyses for gross alpha and gross beta radiation.

b. Assessment of Adverse Reproduction Outcomes

An assessment of adverse reproduction outcomes, i.e. fetal deaths, low birth weight, infant deaths, and presence of congenital anomalies will be conducted for the population in the area where the statistically significant cancer cluster were found.

The rationale for this assessment is that if an environmental factor played a role in the development of the childhood cancers it may have had an impact on developing fetuses and newborn children. This may provide important leads to identify factors that may have played a role in the cancers.

Live births for the years 2003 through 2007 will be used as a denominator for the calculation of rates of adverse reproduction outcomes per 10,000 live births. The live births, fetal deaths, low birth weight babies [less than 2,500 grams], infant deaths, and congenital anomalies will be identified through the population-based, geocoded files in the ODH Office of Vital Statistics. The adverse reproduction outcome rates in the study area will be compared to the Ohio rates for the same years.

c. Follow-up Childhood Cancer Risk Factor Questionnaire

A follow-up ODH *Childhood Cancer Risk Factor Questionnaire* will be administered to the case families in the area where the statistically significant cancer cluster was found. This follow-up instrument will put a greater focus on potential environmental exposures that may have played a role in the development of these cancer.

SCHD

Since the onset of the cancer study, SCHD has been active in routine communications with the case families. In addition to advocating for each case family, SCHD continues to provide local surveillance and oversight for the study itself. Routine meetings, between SCHD and the case families, are held to allow for the disclosure of new information to the families, while maintaining their confidentiality and anonymity. Acting as the study clearinghouse, SCHD will continue to be the lead agency for discussions and information dissemination with local community members and media outlets. For the past year, SCHD has also coordinated monthly conference calls with other local,

state, and federal cluster study partners. Included in these calls are Ohio EPA, ODH, Region 5 Children's Taskforce, United States (US) EPA, and as needed, academic facilities. Additionally, the staff of SCHD continues to have discussions and correspondence with local and state legislators to provide information and advocacy for the study. SCHD personnel will continue to service the ODH air monitors in Clyde to ensure efficiency. SCHD has and will continue to explore other research possibilities that may aid in the study and ongoing investigation. Currently, SCHD staff is working closely with medical personnel to research metabolic and biochemical responses, with regard to pediatric cancers. Throughout the 1980s and 1990s, groundwater monitoring was performed in the areas surrounding VEI. Data from that monitoring is being reviewed again by current SCHD personnel. Utilizing the information from that historical review, SCHD is evaluating the possibility of re-establishing a monitoring study for groundwater in the areas around VEI. SCHD personnel are also investigating the possibilities of constructing various maps to overlay data, both environmental and industrial, in relation to the Eastern Sandusky County cancer cluster.

Ohio EPA

Air

Since March of 2008, Ohio EPA has conducted weekly surveillance of the Clyde area for unusual air emissions and has conducted inspections of local industry to determine compliance with applicable regulations. While odors from local industry have been noted, no significant air violations have been found.

In January 2009, Ohio EPA began monitoring the Clyde area for organic chemicals and heavy metals. Monitoring has been done at various locations in the area with over 78 samples taken to date. The preliminary results of the air monitoring, to date, do not indicate cause for concern. This monitoring will continue through at least the end of the 2009 calendar year.

Biological and Water Quality Survey

Ohio EPA conducted a Biological and Water Quality Survey of the Lower Sandusky River watershed during the summer of 2009. The survey includes an assessment of fish and macro invertebrate populations, stream habitat and water quality and sediment chemistry. Data generated from the study will be used to report on the attainment of aquatic life use designations and to support the development of a Total Maximum Daily Load (TMDL) where impairment is documented. A goal of May 2010 has been set to complete the Technical Support Document that will summarize the results of all environmental testing done in the focus study area.

Conclusion

State and local agencies will continue to work together in the ongoing investigation of the Eastern Sandusky County Cancer Cluster. Additional information gathered in this investigation will be shared with the community as it becomes available. The agencies involved will continue to strive to find answers. However, it is possible that a cause may never be known for the higher than expected number of childhood cancer diagnoses in Eastern Sandusky County.

Attachment A

Whirlpool TRI Data (1998-2007)

WHIRLPOOL CORP - CLYDE DIV TRI Reports 1988-2007					
Facility name	Year	Chemical	Fugitive Air lbs/year	Stack Air lbs/year	Total Air lbs/year
WHIRLPOOL CORP - CLYDE DIV	1988	2-ETHOXYETHANOL	250	21812	22062
WHIRLPOOL CORP - CLYDE DIV	1988	ALUMINUM OXIDE (FIBROUS FORMS)	1235	250	1485
WHIRLPOOL CORP - CLYDE DIV	1988	BARIUM	750	250	1000
WHIRLPOOL CORP - CLYDE DIV	1988	DIETHANOLAMINE	250	0	250
WHIRLPOOL CORP - CLYDE DIV	1988	HYDROCHLORIC ACID (1995 AND AFTER 'ACID AEROSOLS' ONLY)	250	0	250
WHIRLPOOL CORP - CLYDE DIV	1988	N-BUTYL ALCOHOL	750	26681	27431
WHIRLPOOL CORP - CLYDE DIV	1988	NICKEL COMPOUNDS	750	250	1000
WHIRLPOOL CORP - CLYDE DIV	1988	PHOSPHORIC ACID	1858	0	1858
WHIRLPOOL CORP - CLYDE DIV	1988	POLYCHLORINATED BIPHENYLS	0	0	0

WHIRLPOOL CORP - CLYDE DIV	1988	SODIUM HYDROXIDE (SOLUTION)	750	0	750
WHIRLPOOL CORP - CLYDE DIV	1988	SULFURIC ACID (1994 AND AFTER 'ACID AEROSOLS' ONLY)	250	0	250
WHIRLPOOL CORP - CLYDE DIV	1988	TOLUENE	250	28619	28869
WHIRLPOOL CORP - CLYDE DIV	1988	XYLENE (MIXED ISOMERS)	4701	393312	398013
WHIRLPOOL CORP - CLYDE DIV	1988	ZINC (FUME OR DUST)	1349	250	1599
WHIRLPOOL CORP - CLYDE DIV	1989	ALUMINUM OXIDE (FIBROUS FORMS)	1160	250	1410
WHIRLPOOL CORP - CLYDE DIV	1989	BARIUM COMPOUNDS	750	250	1000
WHIRLPOOL CORP - CLYDE DIV	1989	CERTAIN GLYCOL ETHERS	1762	266128	267890
WHIRLPOOL CORP - CLYDE DIV	1989	CHROMIUM COMPOUNDS(EXCEPT CHROMITE ORE MINED IN THE TRANSVAAL REGION)	250	250	500
WHIRLPOOL CORP - CLYDE DIV	1989	COBALT COMPOUNDS	250	0	250
WHIRLPOOL CORP - CLYDE DIV	1989	DIETHANOLAMINE	250	0	250
WHIRLPOOL CORP - CLYDE DIV	1989	ETHYLBENZENE	750	42461	43211

WHIRLPOOL CORP - CLYDE DIV	1989	HYDROCHLORIC ACID (1995 AND AFTER 'ACID AEROSOLS' ONLY)	250	0	250
WHIRLPOOL CORP - CLYDE DIV	1989	N-BUTYL ALCOHOL	250	31154	31404
WHIRLPOOL CORP - CLYDE DIV	1989	NICKEL COMPOUNDS	750	250	1000
WHIRLPOOL CORP - CLYDE DIV	1989	PHOSPHORIC ACID	750	0	750
WHIRLPOOL CORP - CLYDE DIV	1989	POLYCHLORINATED BIPHENYLS	0	0	0
WHIRLPOOL CORP - CLYDE DIV	1989	SULFURIC ACID (1994 AND AFTER 'ACID AEROSOLS' ONLY)	250	0	250
WHIRLPOOL CORP - CLYDE DIV	1989	TOLUENE	250	38317	38567
WHIRLPOOL CORP - CLYDE DIV	1989	XYLENE (MIXED ISOMERS)	3789	329849	333638
WHIRLPOOL CORP - CLYDE DIV	1989	ZINC COMPOUNDS	1832	250	2082
WHIRLPOOL CORP - CLYDE DIV	1990	ALUMINUM OXIDE (FIBROUS FORMS)	1172	250	1422
WHIRLPOOL CORP - CLYDE DIV	1990	BARIUM COMPOUNDS	750	250	1000
WHIRLPOOL CORP - CLYDE DIV	1990	CERTAIN GLYCOL ETHERS	750	105601	106351

WHIRLPOOL CORP - CLYDE DIV	1990	CHROMIUM COMPOUNDS(EXCEPT CHROMITE ORE MINED IN THE TRANSVAAL REGION)	250	5	255
WHIRLPOOL CORP - CLYDE DIV	1990	COBALT COMPOUNDS	250	0	250
WHIRLPOOL CORP - CLYDE DIV	1990	DIETHANOLAMINE	250	0	250
WHIRLPOOL CORP - CLYDE DIV	1990	ETHYLBENZENE	511	36872	37383
WHIRLPOOL CORP - CLYDE DIV	1990	HYDROCHLORIC ACID (1995 AND AFTER 'ACID AEROSOLS' ONLY)	250	0	250
WHIRLPOOL CORP - CLYDE DIV	1990	N-BUTYL ALCOHOL	241	23101	23342
WHIRLPOOL CORP - CLYDE DIV	1990	NICKEL COMPOUNDS	750	5	755
WHIRLPOOL CORP - CLYDE DIV	1990	PHOSPHORIC ACID	250	0	250
WHIRLPOOL CORP - CLYDE DIV	1990	SULFURIC ACID (1994 AND AFTER 'ACID AEROSOLS' ONLY)	250	0	250
WHIRLPOOL CORP - CLYDE DIV	1990	TOLUENE	250	28417	28667
WHIRLPOOL CORP - CLYDE DIV	1990	XYLENE (MIXED ISOMERS)	3591	295800	299391
WHIRLPOOL CORP - CLYDE DIV	1990	ZINC COMPOUNDS	750	5	755

WHIRLPOOL CORP - CLYDE DIV	1991	BARIUM COMPOUNDS	950	60	1010
WHIRLPOOL CORP - CLYDE DIV	1991	COBALT COMPOUNDS	220	2	222
WHIRLPOOL CORP - CLYDE DIV	1991	DIETHANOLAMINE	200	0	200
WHIRLPOOL CORP - CLYDE DIV	1991	ETHYLBENZENE	300	19000	19300
WHIRLPOOL CORP - CLYDE DIV	1991	HYDROCHLORIC ACID (1995 AND AFTER 'ACID AEROSOLS' ONLY)	290	0	290
WHIRLPOOL CORP - CLYDE DIV	1991	N-BUTYL ALCOHOL	280	25777	26057
WHIRLPOOL CORP - CLYDE DIV	1991	NICKEL COMPOUNDS	500	30	530
WHIRLPOOL CORP - CLYDE DIV	1991	PHOSPHORIC ACID	450	0	450
WHIRLPOOL CORP - CLYDE DIV	1991	SULFURIC ACID (1994 AND AFTER 'ACID AEROSOLS' ONLY)	25	0	25
WHIRLPOOL CORP - CLYDE DIV	1991	TOLUENE	481	36005	36486
WHIRLPOOL CORP - CLYDE DIV	1991	XYLENE (MIXED ISOMERS)	3000	250000	253000
WHIRLPOOL CORP - CLYDE DIV	1991	ZINC COMPOUNDS	200	20	220

WHIRLPOOL CORP - CLYDE DIV	1992	BARIUM COMPOUNDS	5	30	35
WHIRLPOOL CORP - CLYDE DIV	1992	CERTAIN GLYCOL ETHERS	609	93609	94218
WHIRLPOOL CORP - CLYDE DIV	1992	COBALT COMPOUNDS	2	0	2
WHIRLPOOL CORP - CLYDE DIV	1992	DIETHANOLAMINE	128	0	128
WHIRLPOOL CORP - CLYDE DIV	1992	ETHYLBENZENE	466	36376	36842
WHIRLPOOL CORP - CLYDE DIV	1992	HYDROCHLORIC ACID (1995 AND AFTER 'ACID AEROSOLS' ONLY)	113	0	113
WHIRLPOOL CORP - CLYDE DIV	1992	N-BUTYL ALCOHOL	263	24195	24458
WHIRLPOOL CORP - CLYDE DIV	1992	NICKEL COMPOUNDS	3	20	23
WHIRLPOOL CORP - CLYDE DIV	1992	PHOSPHORIC ACID	1	0	1
WHIRLPOOL CORP - CLYDE DIV	1992	SULFURIC ACID (1994 AND AFTER 'ACID AEROSOLS' ONLY)	2	0	2
WHIRLPOOL CORP - CLYDE DIV	1992	TOLUENE	450	36196	36646
WHIRLPOOL CORP - CLYDE DIV	1992	XYLENE (MIXED ISOMERS)	2256	179892	182148

WHIRLPOOL CORP - CLYDE DIV	1992	ZINC COMPOUNDS	19	20	39
WHIRLPOOL CORP - CLYDE DIV	1993	CERTAIN GLYCOL ETHERS	528	81279	81807
WHIRLPOOL CORP - CLYDE DIV	1993	DIETHANOLAMINE	142	0	142
WHIRLPOOL CORP - CLYDE DIV	1993	ETHYLBENZENE	547	37361	37908
WHIRLPOOL CORP - CLYDE DIV	1993	HYDROCHLORIC ACID (1995 AND AFTER 'ACID AEROSOLS' ONLY)	182	0	182
WHIRLPOOL CORP - CLYDE DIV	1993	MANGANESE COMPOUNDS	9	58	67
WHIRLPOOL CORP - CLYDE DIV	1993	N-BUTYL ALCOHOL	258	24757	25015
WHIRLPOOL CORP - CLYDE DIV	1993	NICKEL COMPOUNDS	11	6	17
WHIRLPOOL CORP - CLYDE DIV	1993	PHOSPHORIC ACID	932	0	932
WHIRLPOOL CORP - CLYDE DIV	1993	SULFURIC ACID (1994 AND AFTER 'ACID AEROSOLS' ONLY)	19	0	19
WHIRLPOOL CORP - CLYDE DIV	1993	TOLUENE	371	35808	36179
WHIRLPOOL CORP - CLYDE DIV	1993	XYLENE (MIXED ISOMERS)	2020	147443	149463

WHIRLPOOL CORP - CLYDE DIV	1993	ZINC COMPOUNDS	15	1	16
WHIRLPOOL CORP - CLYDE DIV	1994	CERTAIN GLYCOL ETHERS	547	86215	86762
WHIRLPOOL CORP - CLYDE DIV	1994	DIETHANOLAMINE	238	0	238
WHIRLPOOL CORP - CLYDE DIV	1994	ETHYLBENZENE	237	12042	12279
WHIRLPOOL CORP - CLYDE DIV	1994	HYDROCHLORIC ACID (1995 AND AFTER 'ACID AEROSOLS' ONLY)	75	0	75
WHIRLPOOL CORP - CLYDE DIV	1994	MANGANESE COMPOUNDS	10	5	15
WHIRLPOOL CORP - CLYDE DIV	1994	N-BUTYL ALCOHOL	251	24095	24346
WHIRLPOOL CORP - CLYDE DIV	1994	NICKEL COMPOUNDS	12	7	19
WHIRLPOOL CORP - CLYDE DIV	1994	PHOSPHORIC ACID	732	0	732
WHIRLPOOL CORP - CLYDE DIV	1994	TOLUENE	411	40015	40426
WHIRLPOOL CORP - CLYDE DIV	1994	XYLENE (MIXED ISOMERS)	1166	66819	67985
WHIRLPOOL CORP - CLYDE DIV	1994	ZINC COMPOUNDS	13	0	13

WHIRLPOOL CORP - CLYDE DIV	1995	CERTAIN GLYCOL ETHERS	1108	89937	91045
WHIRLPOOL CORP - CLYDE DIV	1995	ETHYLBENZENE	1085	19819	20904
WHIRLPOOL CORP - CLYDE DIV	1995	MANGANESE COMPOUNDS	10	4	14
WHIRLPOOL CORP - CLYDE DIV	1995	N-BUTYL ALCOHOL	285	26734	27019
WHIRLPOOL CORP - CLYDE DIV	1995	NICKEL COMPOUNDS	12	7	19
WHIRLPOOL CORP - CLYDE DIV	1995	PHOSPHORIC ACID	764	0	764
WHIRLPOOL CORP - CLYDE DIV	1995	TOLUENE	448	43598	44046
WHIRLPOOL CORP - CLYDE DIV	1995	XYLENE (MIXED ISOMERS)	1419	82385	83804
WHIRLPOOL CORP - CLYDE DIV	1995	ZINC COMPOUNDS	13	0	13
WHIRLPOOL CORP - CLYDE DIV	1996	CERTAIN GLYCOL ETHERS	2086	161643	163729
WHIRLPOOL CORP - CLYDE DIV	1996	DIETHANOLAMINE	63	0	63
WHIRLPOOL CORP - CLYDE DIV	1996	ETHYLBENZENE	599	9668	10267

WHIRLPOOL CORP - CLYDE DIV	1996	MANGANESE COMPOUNDS	13	5	18
WHIRLPOOL CORP - CLYDE DIV	1996	N-BUTYL ALCOHOL	143	13528	13671
WHIRLPOOL CORP - CLYDE DIV	1996	NICKEL COMPOUNDS	11	7	18
WHIRLPOOL CORP - CLYDE DIV	1996	PHOSPHORIC ACID	1019	0	1019
WHIRLPOOL CORP - CLYDE DIV	1996	SODIUM NITRITE	22	0	22
WHIRLPOOL CORP - CLYDE DIV	1996	TOLUENE	226	22104	22330
WHIRLPOOL CORP - CLYDE DIV	1996	XYLENE (MIXED ISOMERS)	728	46413	47141
WHIRLPOOL CORP - CLYDE DIV	1996	ZINC COMPOUNDS	27	0	27
WHIRLPOOL CORP - CLYDE DIV	1997	CERTAIN GLYCOL ETHERS	1877	145479	147356
WHIRLPOOL CORP - CLYDE DIV	1997	DIETHANOLAMINE	70	0	70
WHIRLPOOL CORP - CLYDE DIV	1997	MANGANESE COMPOUNDS	12	12	24
WHIRLPOOL CORP - CLYDE DIV	1997	NICKEL COMPOUNDS	11	7	18

WHIRLPOOL CORP - CLYDE DIV	1997	PHOSPHORIC ACID	1035	0	1035
WHIRLPOOL CORP - CLYDE DIV	1997	SODIUM NITRITE	23	0	23
WHIRLPOOL CORP - CLYDE DIV	1997	TOLUENE	115	11131	11246
WHIRLPOOL CORP - CLYDE DIV	1997	XYLENE (MIXED ISOMERS)	422	35783	36205
WHIRLPOOL CORP - CLYDE DIV	1997	ZINC COMPOUNDS	26	0	26
WHIRLPOOL CORP - CLYDE DIV	1998	CERTAIN GLYCOL ETHERS	4032	110073	114105
WHIRLPOOL CORP - CLYDE DIV	1998	COBALT COMPOUNDS	229	0	229
WHIRLPOOL CORP - CLYDE DIV	1998	DIETHANOLAMINE	99	0	99
WHIRLPOOL CORP - CLYDE DIV	1998	ETHYLBENZENE	197	17242	17439
WHIRLPOOL CORP - CLYDE DIV	1998	MANGANESE COMPOUNDS	778	78	856
WHIRLPOOL CORP - CLYDE DIV	1998	NICKEL COMPOUNDS	674	67	741
WHIRLPOOL CORP - CLYDE DIV	1998	NITRIC ACID	725	0	725

WHIRLPOOL CORP - CLYDE DIV	1998	SODIUM NITRITE	448	0	448
WHIRLPOOL CORP - CLYDE DIV	1998	TOLUENE	148	14137	14285
WHIRLPOOL CORP - CLYDE DIV	1998	XYLENE (MIXED ISOMERS)	701	64208	64909
WHIRLPOOL CORP - CLYDE DIV	1998	ZINC COMPOUNDS	890	89	979
WHIRLPOOL CORP - CLYDE DIV	1999	BARIUM COMPOUNDS	17	0	17
WHIRLPOOL CORP - CLYDE DIV	1999	CERTAIN GLYCOL ETHERS	6275	169135	175410
WHIRLPOOL CORP - CLYDE DIV	1999	COBALT COMPOUNDS	4	0	4
WHIRLPOOL CORP - CLYDE DIV	1999	DIETHANOLAMINE	108	0	108
WHIRLPOOL CORP - CLYDE DIV	1999	ETHYLBENZENE	211	19562	19773
WHIRLPOOL CORP - CLYDE DIV	1999	MANGANESE COMPOUNDS	13	0	13
WHIRLPOOL CORP - CLYDE DIV	1999	NICKEL COMPOUNDS	18	0	18
WHIRLPOOL CORP - CLYDE DIV	1999	NITRIC ACID	1299	0	1299

WHIRLPOOL CORP - CLYDE DIV	1999	SODIUM NITRITE	9	0	9
WHIRLPOOL CORP - CLYDE DIV	1999	XYLENE (MIXED ISOMERS)	759	69722	70481
WHIRLPOOL CORP - CLYDE DIV	1999	ZINC COMPOUNDS	3	0	3
WHIRLPOOL CORP - CLYDE DIV	2000	BARIUM COMPOUNDS	14	0	14
WHIRLPOOL CORP - CLYDE DIV	2000	CERTAIN GLYCOL ETHERS	5585	149432	155017
WHIRLPOOL CORP - CLYDE DIV	2000	COBALT COMPOUNDS	4	0	4
WHIRLPOOL CORP - CLYDE DIV	2000	ETHYLBENZENE	242	23195	23437
WHIRLPOOL CORP - CLYDE DIV	2000	MANGANESE COMPOUNDS	13	0	13
WHIRLPOOL CORP - CLYDE DIV	2000	NICKEL COMPOUNDS	14	0	14
WHIRLPOOL CORP - CLYDE DIV	2000	NITRIC ACID	1947	0	1947
WHIRLPOOL CORP - CLYDE DIV	2000	SODIUM NITRITE	0	0	0
WHIRLPOOL CORP - CLYDE DIV	2000	XYLENE (MIXED ISOMERS)	857	81635	82492

WHIRLPOOL CORP - CLYDE DIV	2000	ZINC COMPOUNDS	24	0	24
WHIRLPOOL CORP - CLYDE DIV	2001	BARIUM	14	0	14
WHIRLPOOL CORP - CLYDE DIV	2001	CERTAIN GLYCOL ETHERS	5627	149281	154908
WHIRLPOOL CORP - CLYDE DIV	2001	COBALT	4	0	4
WHIRLPOOL CORP - CLYDE DIV	2001	ETHYLBENZENE	262	25318	25580
WHIRLPOOL CORP - CLYDE DIV	2001	MANGANESE COMPOUNDS	13	0	13
WHIRLPOOL CORP - CLYDE DIV	2001	NICKEL	12	0	12
WHIRLPOOL CORP - CLYDE DIV	2001	NITRIC ACID	1245	0	1245
WHIRLPOOL CORP - CLYDE DIV	2001	SODIUM NITRITE	0	0	0
WHIRLPOOL CORP - CLYDE DIV	2001	XYLENE (MIXED ISOMERS)	937	89976	90913
WHIRLPOOL CORP - CLYDE DIV	2001	ZINC COMPOUNDS	14	0	14
WHIRLPOOL CORP - CLYDE DIV	2002	BARIUM	13	5	18

WHIRLPOOL CORP - CLYDE DIV	2002	CERTAIN GLYCOL ETHERS	1436	28848	30284
WHIRLPOOL CORP - CLYDE DIV	2002	COBALT	3	0	3
WHIRLPOOL CORP - CLYDE DIV	2002	ETHYLBENZENE	165	14777	14942
WHIRLPOOL CORP - CLYDE DIV	2002	MANGANESE COMPOUNDS	10	0	10
WHIRLPOOL CORP - CLYDE DIV	2002	NICKEL	10	0	10
WHIRLPOOL CORP - CLYDE DIV	2002	NITRIC ACID	935	0	935
WHIRLPOOL CORP - CLYDE DIV	2002	SODIUM NITRITE	0	0	0
WHIRLPOOL CORP - CLYDE DIV	2002	XYLENE (MIXED ISOMERS)	584	44160	44744
WHIRLPOOL CORP - CLYDE DIV	2002	ZINC COMPOUNDS	11	0	11
WHIRLPOOL CORP - CLYDE DIV	2003	BARIUM	5	0	5
WHIRLPOOL CORP - CLYDE DIV	2003	CERTAIN GLYCOL ETHERS	3830	117803	121633
WHIRLPOOL CORP - CLYDE DIV	2003	ETHYLBENZENE	241	20775	21016

WHIRLPOOL CORP - CLYDE DIV	2003	MANGANESE COMPOUNDS	4	0	4
WHIRLPOOL CORP - CLYDE DIV	2003	NICKEL	4	0	4
WHIRLPOOL CORP - CLYDE DIV	2003	NITRIC ACID	848	0	848
WHIRLPOOL CORP - CLYDE DIV	2003	XYLENE (MIXED ISOMERS)	841	66469	67310
WHIRLPOOL CORP - CLYDE DIV	2003	ZINC COMPOUNDS	9	0	9
WHIRLPOOL CORP - CLYDE DIV	2004	BARIUM	11	0	11
WHIRLPOOL CORP - CLYDE DIV	2004	CERTAIN GLYCOL ETHERS	4000	130463	134463
WHIRLPOOL CORP - CLYDE DIV	2004	ETHYLBENZENE	135	8785	8920
WHIRLPOOL CORP - CLYDE DIV	2004	FORMIC ACID	202	0	202
WHIRLPOOL CORP - CLYDE DIV	2004	MANGANESE COMPOUNDS	5	0	5
WHIRLPOOL CORP - CLYDE DIV	2004	NICKEL	6	0	6
WHIRLPOOL CORP - CLYDE DIV	2004	NITRIC ACID	2018	0	2018

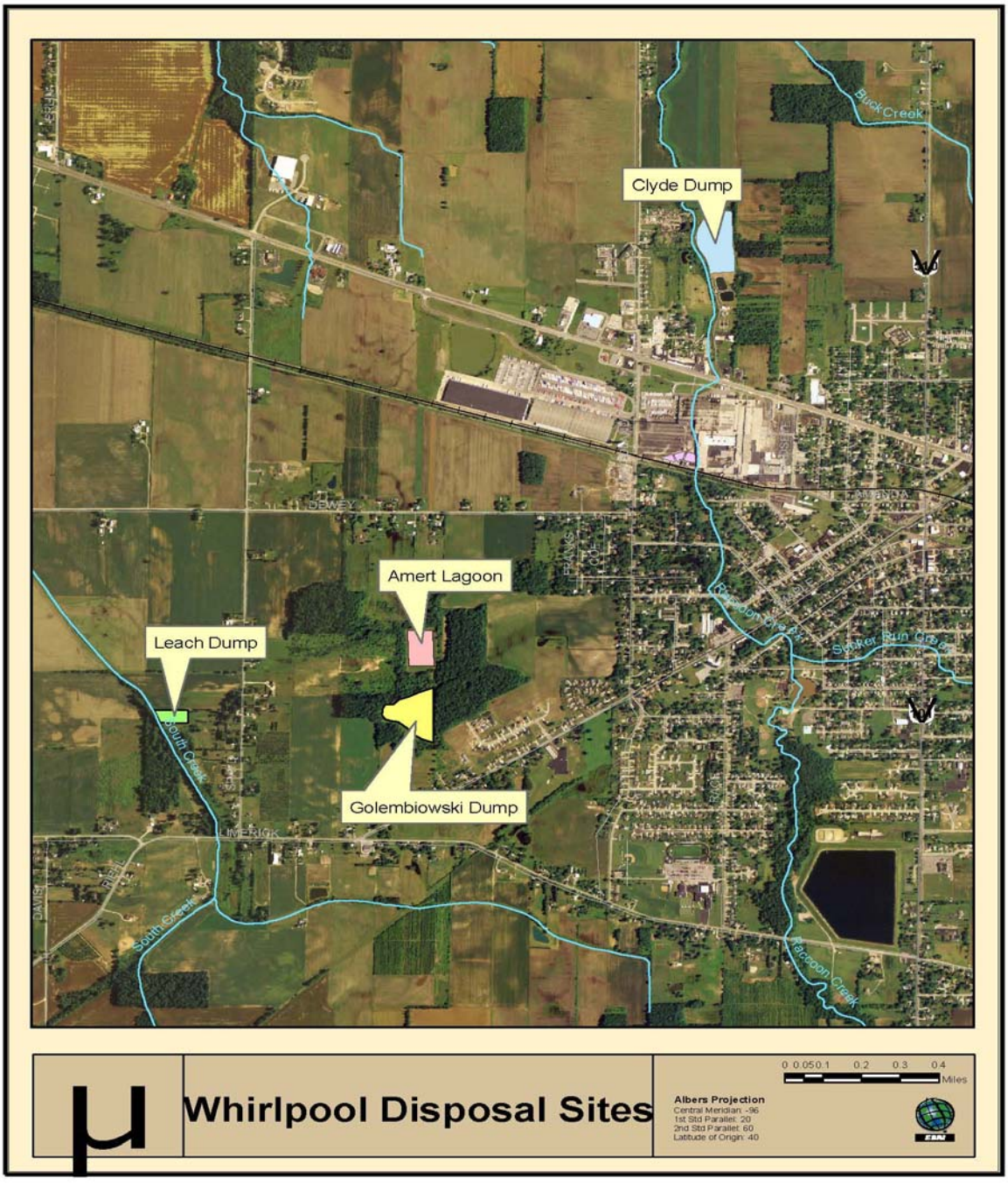
WHIRLPOOL CORP - CLYDE DIV	2004	XYLENE (MIXED ISOMERS)	707	48006	48713
WHIRLPOOL CORP - CLYDE DIV	2004	ZINC COMPOUNDS	25	0	25
WHIRLPOOL CORP - CLYDE DIV	2005	BARIUM	5	0	5
WHIRLPOOL CORP - CLYDE DIV	2005	CERTAIN GLYCOL ETHERS	2040	65056	67096
WHIRLPOOL CORP - CLYDE DIV	2005	ETHYLBENZENE	142	6887	7029
WHIRLPOOL CORP - CLYDE DIV	2005	MANGANESE COMPOUNDS	7	0	7
WHIRLPOOL CORP - CLYDE DIV	2005	NICKEL	7	0	7
WHIRLPOOL CORP - CLYDE DIV	2005	NITRIC ACID	805	0	805
WHIRLPOOL CORP - CLYDE DIV	2005	XYLENE (MIXED ISOMERS)	495	13238	13733
WHIRLPOOL CORP - CLYDE DIV	2005	ZINC COMPOUNDS	9	0	9
WHIRLPOOL CORP - CLYDE DIV	2006	BARIUM	8	0	8
WHIRLPOOL CORP - CLYDE DIV	2006	CERTAIN GLYCOL ETHERS	2425	77267	79692

WHIRLPOOL CORP - CLYDE DIV	2006	ETHYLBENZENE	211	9655	9866
WHIRLPOOL CORP - CLYDE DIV	2006	MANGANESE COMPOUNDS	15	0	15
WHIRLPOOL CORP - CLYDE DIV	2006	NICKEL	7	0	7
WHIRLPOOL CORP - CLYDE DIV	2006	NITRIC ACID	602	0	602
WHIRLPOOL CORP - CLYDE DIV	2006	SODIUM NITRITE	0	0	0
WHIRLPOOL CORP - CLYDE DIV	2006	XYLENE (MIXED ISOMERS)	737	16905	17642
WHIRLPOOL CORP - CLYDE DIV	2006	ZINC COMPOUNDS	6	0	6
WHIRLPOOL CORP - CLYDE DIV	2007	BARIUM	7	0	7
WHIRLPOOL CORP - CLYDE DIV	2007	CERTAIN GLYCOL ETHERS	3253	104642	107895
WHIRLPOOL CORP - CLYDE DIV	2007	ETHYLBENZENE	133	10133	10266
WHIRLPOOL CORP - CLYDE DIV	2007	MANGANESE COMPOUNDS	39	0	39
WHIRLPOOL CORP - CLYDE DIV	2007	NICKEL	6	0	6

WHIRLPOOL CORP - CLYDE DIV	2007	NITRIC ACID	602	0	602
WHIRLPOOL CORP - CLYDE DIV	2007	SODIUM NITRITE	0	0	0
WHIRLPOOL CORP - CLYDE DIV	2007	XYLENE (MIXED ISOMERS)	474	31679	32153

Attachment B

Map of Disposal Sites Utilized by Whirlpool



Attachment C

Map of Disposal Sites in the Clyde and Green Creek Township Area

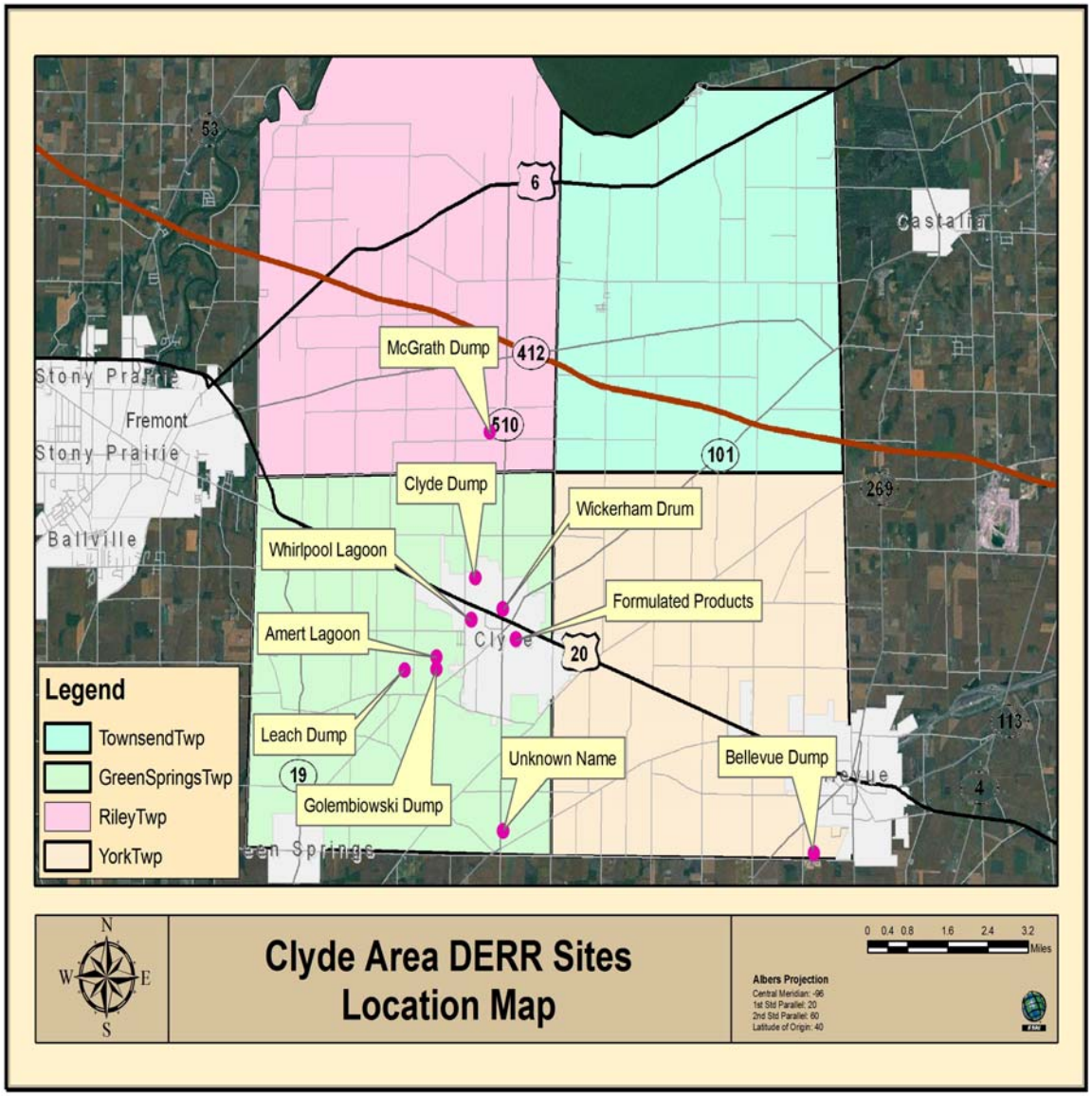


EXHIBIT E

CHILDHOOD CANCER IN EASTERN SANDUSKY COUNTY, 1996-2010: A PROFILE OF 21 CASES

Sandusky County Health Department

And

Comprehensive Cancer Control Program
Bureau of Health Promotion and Risk Reduction
Ohio Department of Health

FINAL REPORT
May 26, 2011

EXECUTIVE SUMMARY

Background

- The Sandusky County Health Department (SCHD) and the Ohio Department of Health (ODH) completed an analysis of cancer incidence among residents aged 0-19 years of the city of Clyde and Green Creek Township for the years 1996-2006. This analysis revealed a higher than expected number of childhood cancers for the 11-year time period 1996-2006 (10 cases observed, 5.32 expected). Cancers of the brain and other central nervous system were found to be significantly higher than the number of expected cases (4 cases observed, 0.92 expected).

- A 2007 profile of 14 children with cancer using an instrument developed by the ODH – *Cancer Risk Factor Questionnaire for Cases 19 Years of Age and Younger* – did not reveal any common factors among the 14 children that participated in the profile.

- In 2009 the ODH, in partnership with the Comprehensive Cancer Center and James Cancer Hospital and Solove Research Institute at Ohio State University, conducted a spatial (geographic) analysis of the residential addresses at diagnosis of children with cancer in Sandusky County and the surrounding area for the years 1996-2006. The results indicated a cluster of 31 children with cancer in Sandusky County that included Clyde, Green Creek Township, and most of Fremont. This cluster had a radius of 6.7 miles and a p-value of less than 0.05, indicating statistical significance, i.e. this clustering could have occurred by chance alone less than five times out of 100.

- There were no new diagnoses of children with cancer in the eastern Sandusky County cluster area reported to the SCHD during 2007. However, there were two new diagnoses in 2008, another in 2009, and another in 2010 reported to the SCHD. The SCHD verified the diagnoses through physician consultation and medical record review. Thus, there was a total of 35 known children with verified cancer among residents 19 years and younger in the eastern Sandusky County cluster area diagnosed during the years 1996-2010.

- Consultation with the parents of the children with cancer, SCHD, and the Ohio Environmental Protection Agency (EPA) resulted in a decision to expand the 2007 profile to all 35 households of children with cancer.

- It was also decided that it would be advantageous to include more questions pursuing possible environmental exposures in the interview instrument. A supplemental questionnaire – *Supplemental Environmental Cancer Risk Factor Questionnaire for Cancer Cases 19 Years of Age and Younger* – was developed for the expanded profile.

Known and Suspect Risk Factors for Childhood Cancer: A Brief Review

- The causes and risk factors for childhood cancer are largely unknown.

- Extensive exposure to ionizing radiation and some chemicals, e.g. benzene, increase the risk of developing some types of childhood cancers.

- Several inherited genetic syndromes, e.g. Li-Fraumeni, and acquired conditions, e.g. aplastic anemia, increase the risk of developing some types of childhood cancer.

- Viruses that are thought to increase childhood cancer risk include the Epstein-Barr and the human lymphotropic viruses I and II.

Objective

The objective of this profile of cases in this "cluster" of childhood cancer in eastern Sandusky County was to identify factors that may have contributed to the increased burden. It needs to be understood that the nature of such a profile does not provide sufficient information to determine individual cause and effect.

Methods

- The SCHD attempted to contact the parents of the 35 children with cancer to invite them to participate in the profile. Twenty-one (60%) agreed to participate. The remaining 14 households either declined to participate or the SCHD was unable to establish contact.

- The parents were interviewed using two instruments: (1) *Cancer Risk Factor Questionnaire for Cases 19 Years of Age and Younger* and, (2) *Supplemental Environmental Risk Factor Questionnaire for Cases 19 Years of Age and Younger*. The *Supplemental* questionnaire was administered to the households that participated in the first profile and both instruments were administered to the households in the expanded area.

- All interviews were conducted by SCHD Environmental Health and Nursing staff.

Results

- The 21 participating children had cancers consisting of malignancies of the brain and other central nervous system (n=7), leukemia (n=3), Hodgkin's lymphoma (n=2), melanoma of the skin (n=2), rhabdomyosarcoma (n=3), Ewing's sarcoma (n=1), thyroid cancer (n=1), osteosarcoma (n=1), and cancer of the pancreas (n=1). The age at diagnosis ranged from less than one year to 19 years of age. The mean age at diagnosis was 10 years.

- All 21 children with cancer had at least one blood relative that reportedly was diagnosed with some type of cancer. There were a total of 76 blood relatives with cancer for the 21 children with a mean of 3.6 per case. Five (24%) of these reported histories included the same type of cancer as the child.

- An extensive review of possible environmental exposures did not reveal any exposures that were common to the children with cancer.

Conclusion

- There were no exposures or variables that were common to the 21 children with cancer who participated in this profile.

Recommendations

- Share the results of this profile with the parents of the children with cancer.

- Post this profile on the SCHD and ODH Web sites.

INTRODUCTION

A. Background

1. 2007 Epidemiologic Assessment

- The Sandusky County Health Department (SCHD) and the Ohio Department of Health (ODH) completed an analysis of cancer incidence among childhood residents aged 0-19 years of the city of Clyde and Green Creek Township for the years 1996-2006 and 2002-2006 in April 2007.[1] This analysis revealed a higher than expected number of childhood cancers for the 11-year time period 1996-2006 (10 cases observed, 5.32 expected, standardized incidence ratio [SIR] of 1.88 with 95% confidence interval [CI] of 0.90 -3.45). For the more recent years of 2002-2006, there were eight new diagnoses of cancer among residents 19 years and younger when only 2.47 would be expected, (SIR=3.24, 95% CI of 1.40-6.38). Cancers of the brain and other central nervous system [CNS] were found to be the most frequent type. Four diagnoses of brain and CNS cancer were observed which were significantly higher than the 0.92 expected (SIR=4.35, 95% CI of 1.18-11.13) based on national data.

2. 2007 Profile

- In April 2007 a discussion of the 2007 epidemiologic assessment with the families of the children diagnosed with cancer resulted in a decision to profile the cases and attempt to identify factors that the children may have in common.[2] It was also decided that the profile would include not only the 10 children that were diagnosed among Clyde and Green Creek Township residents but also include eight cases of childhood cancer diagnosed among residents of nearby Riley, Townsend, and York Townships during the years 1996-2006.[1,2]

- The SCHD sent letters to the parents of the 18 children with cancer inviting them to participate in the profile.[2] Fourteen (78%) of the 18 families agreed to participate in the 2007 profile.

- The parents were interviewed using an instrument developed by the ODH - *Cancer Risk Factor Questionnaire for Cases 19 Years of Age and Younger* – for childhood/young adult

cancer profiles such as this.[3] The questionnaire addresses a variety of topics including: personal and family medical and employment and residential histories; possible exposures to chemicals, radiation, and other environmental agents; home and workplace environments; and personal health behaviors such as tobacco use. All interviews were conducted by SCHD environmental health and nursing staff.

- The 2007 profile did not reveal any common factors among the 14 children that participated in the profile.

3. 2009 Spatial Analysis

- As a follow-up to the 2007 epidemiologic assessment and the 2007 profile, the ODH, in partnership with the Comprehensive Cancer Center and James Cancer Hospital and Solove Research Institute at The Ohio State University, conducted a spatial (geographic) analysis of the residential addresses at diagnosis of the children with cancer in Sandusky County and the surrounding area for the years 1996-2006.[4] There were two primary objectives of this analysis: (1) To determine the geographic regions in Sandusky County and the surrounding area where the most likely clusters of cancer among children have occurred; and, (2) To determine the probability (p-value), or likelihood, that the cluster occurred by chance. A p-value of less than 0.05 was considered statistically significant, i.e. the cluster could have occurred by chance alone less than five times out of a 100.

- The analysis used the exact longitude and latitude of the child's residence at diagnosis.

- The results from the spatial analysis indicated a cluster of cases in Sandusky County that included Clyde, Green Creek Township, and most of Fremont. This cluster had a radius of 6.7 miles and a p-value of less than 0.05, indicating statistical significance, i.e. this clustering could have occurred by chance alone less than five times out of 100.

- This eastern Sandusky County cluster included 31 known cases of cancer diagnosed among residents 19 years and younger during the years 1996-2006.

- The results of the 2009 cluster analysis were shared with the parents of the children with cancer and the news media in May 2009.

4. 2007-2010 Additional Cancer Diagnoses among Children

- There were no new diagnoses of cancer among children in the eastern Sandusky County cluster area reported to the SCHD during 2007. However there were two new childhood diagnoses in 2008, another in 2009, and another in 2010 reported to the SCHD. The SCHD obtained signed medical release forms from the parents of the cases and contacted the relevant physicians. The diagnoses were verified by anatomical site and type. Between 1996-2006 there were 31 children in the cluster area with cancer, and four more children were diagnosed with cancer in 2008-2010, thus, 35 childhood cancer cases were diagnosed in the cluster area from 1996-2010.

- After consultation with parents of the children with cancer, SCHD, and the Ohio Environmental Protection Agency (Ohio EPA), a decision was made to expand the profile to include all 35 cases.

- It was also decided that it would be advantageous to include more questions pursuing possible environmental exposures in the case-review instrument.[4] ODH and SCHD staff worked directly with Ohio EPA colleagues to develop a supplemental questionnaire – *Supplemental Environmental Cancer Risk Factor Questionnaire for Cancer Cases 19 Years of Age and Younger* – for the expanded profile.[5]

B. Known and Suspect Risk Factors for Childhood Cancer: A Brief Review

The causes and risk factors for childhood cancer are relatively unknown. It may be helpful to briefly review what is known about risk factors for the types of childhood cancer included in the eastern Sandusky County profile. These are discussed below.

Please keep in mind that the vast majority of childhood cancer cases appear to occur spontaneously with no apparent cause or risk factor present. The discussion of risk factors presented below doesn't necessarily mean that these factors played a common role in these eastern Sandusky County childhood cancers.

Brain and other Central Nervous System Tumors

- Very few risk factors for brain and other CNS tumors have been found.[6,7] There is no clear cause for most brain and other CNS cancers.[6,7] Only two factors are consistently noted to place a child at increased risk for a brain and CNS malignancy: various genetic disorders and exposure to ionizing radiation.[6,7]

- The inherited syndromes associated with brain tumors are: (a) Cowden; (b) Li-Fraumeni; (c) Neurofibromatosis type 1 and type 2; (d) Nevoid basal cell carcinoma; (e) Tuberous sclerosis; (f) Turcot; and (g) non Hippel-Lindau.[6,7] Although these syndromes are rare, they place the child at a markedly high risk for developing brain and other CNS cancers and other malignancies as well.[6,7]

- Exposure to ionizing radiation is a well-documented cause of brain tumors.[6,7] Children treated with radiotherapy for tinea capitis (a fungal infection) during the 1940s and 1950s were found to have increased risk for developing gliomas, meningiomas, and nerve sheath tumors up to 20 to 30 years later.

- In various immunosuppression syndromes, such as Wiskott-Aldrich, ataxia-telangiectasia, and acquired immunodeficiency, and after solid-organ transplantation, lymphoma of the brain occurs at a frequency higher than that in the normal population.[6,7]

- The effect of other environmental exposures, including diet, on the occurrence of brain tumors has been studied by numerous investigations.[6,7] The results of these studies are inconclusive.

- There is suggestive evidence that prenatal and postnatal exposure to secondhand tobacco smoke may increase the risk of childhood brain tumors.[8]

Acute Lymphoblastic Leukemia

- Genetic factors are thought to play a significant role in the cause of acute leukemia including acute lymphoblastic leukemia (ALL).[9,10] Evidence for this is based on several observations, including the association between various chromosomal abnormalities and childhood ALL, the occurrence of familial leukemia, and molecular epidemiologic evidence that highlights the importance of various alleles of specific genes.[9]

- Several chromosomal abnormalities are associated with ALL.[9,10] Children with trisomy 21, i.e. Down syndrome, are up to 15 times more likely to develop ALL than are children without this abnormality. Other less common preexisting chromosomal abnormalities have also been linked to ALL. These include Klinefelter's syndrome, neurofibromatosis, Shwachman syndrome, Bloom syndrome, Fanconi's anemia, and ataxia-telangiectasia. [9,10]

- A higher risk of childhood ALL has been associated with increasing maternal age at conception.[9]

- Multiple cases of ALL within families have been reported, including aggregates among siblings and groups within the same generation or in several generations.[9] The frequency of ALL is higher than expected in families of leukemia patients.[9] Siblings of children with leukemia, including ALL, have about twofold to fourfold greater risk of developing leukemia than do unrelated children in the general population. [9]

- Exposure to ionizing radiation, certain toxic chemicals, and environmental tobacco smoke can facilitate the development of ALL.[9,10] The high incidence of ALL in survivors of atomic bomb explosions in Japan during World War II is well documented. The risk of ALL was greatest for those closest to the explosions. Although the potential of ionizing radiation for causing ALL is accepted, the actual percentage of ALL cases attributed to radiation is thought to be small. Controversy persists about the risks from exposure to ionizing radiation from routine emissions from nuclear power plants or as a result of fallout from atmospheric nuclear testing. Controversy also surrounds the possibility that exposure to electromagnetic fields (EMF) may be causally related to the development of childhood ALL. [9,10]

- Chronic chemical exposure, e.g. to benzene, has been associated with acute leukemia in adults, but direct evidence linking such exposure to ALL in children has been elusive.[9]

- There has been great interest in the possible role of viral infections in the pathogenesis of human leukemia.[9] This has been due in part to the fact that the young age of onset distribution of ALL corresponds with a time when the immune system is developing and is perhaps more vulnerable to the oncogenic effects of particular viruses. Viruses of interest include the Epstein-Barr virus (EBV), human lymphotropic viruses I and II, and human immunodeficiency virus (HIV). [9]

- Children with various congenital immunodeficiency conditions, including Wiskott-Aldrich syndrome and ataxia-telangiectasia have an increased risk of developing lymphoid malignancies, including ALL.[9,10]

Acute Myelogenous Leukemia

- Risk factors associated with the development of acute myelogenous leukemia (AML) can be either environmental or secondary to inherited or acquired predisposing conditions.[10,11]

- Significant exposure to ionizing radiation results in a 10-to-20-fold increase in the incidence of AML.[10,11] For example, individuals who were exposed to radiation from the atomic bombs dropped in Hiroshima and Nagasaki during World War II developed a 20-fold increase in AML. [10,11]

- Exposure to environmental chemical toxins and increased risk for leukemia has been of interest, especially concerning the development of AML.[10,11] Prenatal exposure to maternal cigarette smoke increases the risk of developing AML.[10,11] Maternal use of marijuana and alcohol during pregnancy increases risk of the child developing AML.[10,11] A variety of chemical exposures including petroleum products, benzene, herbicides, and insecticides have been closely linked to the development of AML.[10,11]

- Several genetic risk factors have been identified that predispose individuals to develop AML.[10,11] These factors may be inherited or acquired. The increased frequency of leukemia (both AML and ALL) in siblings of patients with leukemia as well as the relatively rare occurrences of familial leukemia strongly suggest an important hereditary contribution. [10,11]

- Inherited predisposing conditions include Down syndrome, Fanconi's anemia, Kostmann's syndrome, Shwachman-Diamond syndrome, Diamond-Blackfan syndrome, Neurofibromatosis-type I, Ataxia-telangiectasia, Klinefelter's syndrome, Li-Fraumeni syndrome, and Bloom syndrome.[10,11] In general these inherited disorders result in altering the regulation of cell-cycle progression and DNA repair.

- Acquired conditions such as aplastic anemia, myelodysplastic syndrome and paroxysmal nocturnal hemoglobinuria can also predispose to the development of AML.[11]

- However, most cases of AML arise in children for whom there is no known genetic predisposition.[11] Most children with AML do not have a family history of cancer or clinical abnormality that suggests a predisposing risk for development of AML.

Cancer of the Pancreas

- Cancer of the pancreas in children is rare.[12] The causes of pancreatic cancer in children are unknown. There are no recognized genetic syndromes associated with pancreatic carcinoma in children or adolescents.[12]

Rhabdomyosarcoma

- The overwhelming majority of rhabdomyosarcoma (RMS) cases appear to occur sporadically.[13] The development of RMS has been associated with certain familial syndromes such as neurofibromatosis and the Li-Fraumeni syndrome.[13,14] The Li-Fraumeni syndrome has been associated with germline mutations of the P53 tumor suppressor gene. [13,14] This suggests that at least some very young children with seemingly sporadic RMS may have a hereditary predisposition to cancer or, possibly, an increased susceptibility to potentially toxic environmental agents. [13,14]

- The use of marijuana by a mother in the year before a child's birth was associated with a three-fold increased risk of RMS in the child, and maternal cocaine use was associated with a five-fold increased risk.[13] Use of marijuana, cocaine, or any recreational drug by a father was also associated with an approximately two-fold increased risk.[13]

Ewing's Sarcoma

- The causes of Ewing's sarcoma are unknown.[15,16] These sarcomas are not commonly associated with other congenital diseases of childhood.[15,16] No important environment or familial risk factors have been identified for the development of this neoplasm. Radiation exposure does not appear to be a common cause of Ewing's sarcoma. [15,16]

Osteosarcoma

- The peak incidence of osteosarcoma occurs in the second decade of life during the adolescent growth spurt, a feature that suggests a relationship between rapid bone growth and the development of this malignancy.[17] The tumor appears to occur most frequently at sites where the greatest increase in length and size of bone occurs.[17] This has led to the speculation that bone tumors arise from an aberration of the normal process of bone growth and remodeling.[17] Rapidly proliferating cells may be particularly susceptible to oncogenic agents, mitotic errors, or other events leading to neoplastic transformation.[17]

- The causes of osteosarcoma are unknown.[17,18] A viral etiology was long suggested but no convincing data have emerged from the laboratory to demonstrate a causative infectious agent.[17] Antecedent trauma to the bone has also been associated with the development of bone tumors, but little evidence exists to demonstrate a causal relationship.[17]

- The only environmental agent known to produce bone sarcomas in humans is ionizing radiation.[17] Radiation is implicated in about three percent of osteosarcomas.[17]

- Children with certain inherited syndromes have an increased risk of developing osteosarcoma.[17,18] These syndromes include Li-Fraumeni Syndrome, Rothmund-Thomson Syndrome, and hereditary retinoblastoma.[17,18]

- Other investigators have implicated a recessive oncogene, p53, in the etiology or progression of osteosarcoma.[17] The p53 gene appears to be critical in maintaining the integrity of the genome.[17] In normal cells, the presence of DNA damage results in accumulation of p53, which switches off replication to allow time for DNA repair.[17] If repair of DNA damage is unsuccessful, p53 may trigger apoptosis, thus inducing cellular suicide.[17] Thus, cells with mutant or inactivated p53 cannot respond appropriately to DNA-damaging agents and accumulate mutations at an increased rate, leading to malignant transformation.[17] Mutation of the p53 gene are detectable in almost 25 percent of osteosarcomas.[17]

Hodgkin's Lymphoma

- The EBV has been implicated in the causation of Hodgkin's lymphoma by both epidemiologic and serologic studies.[19,20]

- Clusters of cases of Hodgkin's lymphoma suggest a genetic predisposition to the disease or a common exposure to an etiologic agent.[19] Studies of affected families have suggested an association of Hodgkin's lymphoma with specific human lymphocytic antigens.[19]

- Hodgkin's lymphoma is diagnosed more commonly in persons whose immune system is abnormal.[19] This finding may reflect the slight increase in familial incidence. The etiologic factors underlying the immune deficiency include genetic (e.g. ataxia telangiectasia), infectious (e.g. human immunodeficiency virus) and complications of medical treatment.[19]
- There is suggestive evidence that prenatal and postnatal exposure to secondhand smoke may increase the risk of childhood lymphomas.[8]

Thyroid Cancer

- The most significant known risk factors for thyroid cancer are ionizing radiation, a diet low in iodine, and certain genetic syndromes.[21,22]

- The tumorgentic effect of radiation is more severe in a child's thyroid than in an adult.[21,22] The causative role of neck irradiation in the development of thyroid cancer is well established.[21,22]

- Follicular thyroid cancers are more common among populations with diets that are low in iodine.[21,22] In the United States, dietary iodine is plentiful because iodine is added to table

salt and other foods.[21,22] A diet low in iodine may also increase the risk of papillary thyroid cancer if the person is also exposed to radioactivity.[21,22]

- Genetic factors also play a significant role in the development of thyroid cancer.[21, 22] Children with Pendred, Gardner, Cowden, familial polyposis syndromes, and Carney complex have increased risk of thyroid cancer when compared to children without these conditions.[21,22] Familial clusters of papillary thyroid cancer have also been reported.[21]

Melanoma of the Skin

- Childhood melanoma is rare.[12,23] While increased sun exposure has long been associated with adult onset basal and squamous cell carcinoma, and sunburns, particularly, in childhood, with the more deadly melanoma, this model does not appear to apply to pediatric melanoma.[12,23]

- Congenital melanoma may develop *in utero* in the absence of melanoma in the mother.[12]

- Giant congenital melanocytic nevi affect fewer than one in 20,000 newborns, but are precursor lesions of melanoma.[12,23]

- Xeroderma pigmentosum is a rare (1:500,000 births) inherited DNA repair disorder characterized by photosensitivity and a greater than 1000-fold increased risk of skin cancer in patients younger than 20 years.[12,23] Malignant neoplasms of the skin develop in 70 percent of these patients.[12,23]

- Children with immunodeficiencies have a three-to-six-fold increased risk of developing melanoma.[12,23]

- Neurocutaneous melanosis is a rare syndrome characterized by large or multiple congenital nevi associated with meningeal melanosis or melanoma.[12,23]

- It is estimated that about 44 percent of melanomas in persons younger than 30 years arise in small nevis that were present at birth or developed during early childhood.[12,23]

C. Objective

The objective of this profile of cases in this "cluster" of childhood cancer in eastern Sandusky County was to identify factors that may have contributed to the increased burden. It needs to be understood that the nature of such a profile does not provide sufficient information to determine individual cause and effect.

METHODS

- In January 2010 the SCHD attempted to contact the parents of the 35 children with cancer by telephone and/or letters to invite them to participate in the profile. Twenty-one (60%) of the

households agreed to participate. The remaining 14 households either declined to participate or. the SCHD was unable to establish contact with them.

- The parents were interviewed using the two instruments: (1) *Cancer Risk Factor Questionnaire for Cases 19 Years of Age and Younger* (developed by ODH)[3]; and, (2) *Supplemental Environmental Cancer Risk Factor Questionnaire for Cases 19 Years and Younger* (developed by ODH, SCHD, and Ohio EPA)[5]. Please note that the two interview instruments include an extensive array of questions that attempt to clarify the patients' developmental histories and personal environments. It should not be construed that all questions pertain to known or suspect risk factors for childhood cancer.

- Thirteen of the 14 households that participated in the 2007 profile agreed to participate in the 2010 profile. These 13 households were interviewed using only the *Supplemental Environmental Cancer Risk Factor Questionnaire for Cancer Cases 19 Years and Younger.*[5]

- Eight of the households were administered the *Cancer Risk Factor Questionnaire for Cases 19 Years of Age and Younger*[3] and the *Supplemental Environmental Cancer Risk Factor Questionnaire for Cancer Cases 19 Years of Age and Younger*[5].

- All interviews were conducted by SCHD Environmental Health and Nursing staff.

- The data were tabulated and results presented as simple percentages.

RESULTS

1. Cancer Site Type, Age at Diagnosis, Year of Diagnosis, and Gender

- The 21 participating children by cancer site/type, age at diagnosis, year of diagnosis, and sex are presented in Table 1. Seven of the children had malignancies of the brain and other CNS; and five children had leukemia or lymphoma. There were two children with melanoma of the skin, three with rhabdomyosarcoma, one with Ewing's sarcoma, one with thyroid cancer, one with osteosarcoma, and one with cancer of the pancreas. The age at diagnosis ranged from less than one year to 19 years of age. The mean age at diagnosis was 10 years. Two of the children were diagnosed with cancer in 1996, one in 1997, three in 2001, one in 2003, one in 2004, three in 2005, six in 2006, two in 2008, and one each in 2009 and 2010. Nine (43%) were male and 12 (57%) were female.

- For comparison the 14 non-participating children by cancer site/type, age at diagnosis, year of diagnosis, and sex are also presented in Table 1. Overall, the non-participating cases do not differ from the participating cases by demographics. Six of the children had leukemia or lymphoma, and one child had oral cancer, osteosarcoma, soft tissue cancer, liver cancer, ovarian cancer, testicular cancer, and Ewing's sarcoma. The age at diagnosis ranged from less than one to 19 years and the mean age was 11 years. Three of the children were

diagnosed in 1998, two each in 2000, 2001, and 2003, one in 2005, and four in 2006. Six (43%) were male and eight (57%) were female.

2. Estimated Years of Life and Percent of Total Life of Residence in Eastern Sandusky County Prior to Cancer Diagnosis

There is strong evidence that most of the children had lived the vast majority of their lives in Eastern Sandusky County prior to diagnosis as presented in Table 2:

- Thirteen (62%) children had lived all of their lives in Sandusky County and 19 children (91%) had lived at least half of their lives in Sandusky County prior to diagnoses.

3. History of Cancer among Blood Relatives of Case

- All 21 children had at least one blood relative that reportedly was diagnosed with some site/type of cancer in their lifetime. There were a total of 76 blood relatives with cancer for the 21 children, with a mean of 3.6 blood relatives and a range from two to nine blood relatives as presented in Table 3.

- Five (24%) of these reported histories included the same site/type of cancer as the child while 14 (67%) of the family histories did not include the same site/type of cancer as the child. Two of the households related that there was a history of cancer among blood relatives but site/type was unknown.

4. Parental Work Histories and Potential Exposures

- The information regarding parental work histories during fetal development and in the year prior to diagnosis is presented in Table 4. Ten (48%) of 21 households reported “none” or “none known” maternal exposures to chemicals, infectious agents, or radiation prior to diagnosis. Eleven (52%) of the households reported potential maternal exposures to environmental tobacco smoke, infectious agents, pesticides, black mold, cleaning solutions, dry cleaning products, paints, greases, formaldehyde, fiberglass, asbestos, hazardous waste, oils, formalin, and acetone. The vast majority of these potential exposures were reported in an occupational environment.
- Six (29%) of the 21 households reported “none” or “none known” paternal exposures to chemicals, infectious agents, or radiation in the year prior to diagnosis. Two households (10%) did not have knowledge regarding potential paternal exposures. Thirteen (62%) of the households reported potential paternal exposures to herbicides, insecticides, fungicides, ammonia, gasoline fumes, treated lumber, paint, paint thinners, acetone, lead, tar, petroleum products, molds, plastics, concrete dust, and unspecified plastics. Again, the vast majority of these potential exposures were reported in an occupational environment.

5. Estimated Month of Conception and Age of Mother at Conception

- Four (19%) of the mothers with children diagnosed with cancer had an estimated date of conception during January – March, while nine (43%) had a conception date during April – June. Six (29%) had estimated conception dates during July – September, and two (10%) had

estimated conception dates during October – December. The nine children (43%) with estimated dates of conception during April – June included all three children with rhabdomyosarcoma, both children with melanoma of the skin, one of the children with leukemia, a child with pancreatic cancer, and two of the brain and CNS cancers. The little information that is available regarding known causes/risk factors for these childhood cancers makes it difficult to interpret these results. These data are presented in Table 4.

- The age of mother at conception ranged from 17 to 38 years with a mean age of 25 years. These data are also presented in Table 5.

6. Maternal Infectious Disease/Illness and Medication Use during Pregnancy with Child

- Six (29%) of the mothers reported having some type of infectious disease or illness during pregnancy with the patient (chest cold, toxemia, vaginal/uterine infection, pneumonia, and strep B+) as presented in Table 6.

- Seventeen (81%) of the mothers reported taking some type of medication during the pregnancy (prenatal vitamins, n=15, 71%; Tylenol, n=5, 24%; iron supplements, n=1, 5%; and prescription drugs, n=1, 5%). These data are presented in Table 5.

7. Maternal Smoking and Exposure to Environmental Tobacco Smoke at Home/Work during Pregnancy with Patient

- Three (14%) of these mothers reported smoking cigarettes during pregnancy with the child as presented in Table 7. Nine (43%) mothers reported having exposure to environmental tobacco smoke at home and/or at work.

8. Maternal Use of Recreational Drugs, Alcoholic Beverages, and Home Extermination during Pregnancy with Child

- All 21 mothers denied any use of recreational drugs, e.g. marijuana, or alcoholic beverages during pregnancy with the child as presented in Table 8.

- Two (10%) mothers related having their homes treated with “insect bombs” during the pregnancy as indicated in Table 8.

9. Potential Maternal Exposure during Pregnancy with Child to Paints, Cleaning Supplies, Fuels, Solvents, or Other Chemicals

- The data for potential maternal exposure during pregnancy to paints, cleaning supplies, or other chemicals are presented in Table 9. six (29%) reported exposures to paint, with four reporting the exposure to being household paint, and two to paints in a manufacturing plant.

- All mothers denied exposure to non-household cleaning supplies.

- Three (14%) mothers reported potential exposure to propane gas used to heat their homes.

- Two (10%) reported potential exposure to solvents in a manufacturing plant.

- Eight (38%) reported potential exposures to other chemicals including secondary exposure to pesticides via handling fruits and vegetables (n=1); hair dye (n=3); possible radiation exposure in a medical setting (n=1); chlorine in a swimming pool (n=1); and grease, paints or solvents in a manufacturing plant (n=2).

10. Birth Weight of the Children and History of Breast Feeding

- The range in reported birth weight of the children was 5 pounds 6 ounces to 8 pounds 4 ounces as presented in Table 10. The mean birth weight was 7 pounds 5 ounces.

- Thirteen (62%) of the mothers reported breast feeding the children as indicated in Table 10.

11. Health Problems, Diagnosis of Birth Defects and/or Hereditary Diseases and/or Treatments at Birth or Within Six Months after Birth

The reported health problems, diagnosis of birth defects and/or hereditary disease and/or treatments at birth or within six months after birth among the children are presented in Table 11:

- Ten (48%) had no history of health problems at birth or within six months after birth. Four (19%) had jaundice and seven (33%) had an infection at or shortly after birth (Respiratory Syncytial Virus, chicken pox, colds, upper respiratory infections, and thrush). Four (19%) had other problems including a need for resuscitation at birth, umbilical cord around arm, epileptic seizures, allergies, formula intolerance, allergic colitis, and reflux with vomiting.

- Nineteen (90%) had no reported history of diagnosis of birth defects or hereditary disease. One (5%) reported a diagnosis of “webbed toes” and one (5%) reported detection of the cardiomyopathy gene.

- Thirteen (62%) had no history of treatments at birth or during the six months after birth. Four (19%) received antibiotics for thrush or other infections. Two (10%) received UV light treatment for jaundice and two (10%) received oxygen via a respirator shortly after birth.

12. Childhood Histories of Infectious Diseases, Immunizations, and Exposure to Mononucleosis Prior to Cancer Diagnosis

The reported histories of infectious diseases, immunizations, and exposure to mononucleosis are presented in Table 12:

- Sixteen (76%) of the children had histories of some type of infectious disease prior to the diagnosis of cancer. Thirteen (62%) had a history of chicken pox. Other infections included Respiratory Syncytial Virus (n=2), EBV (n=1), Rotavirus (n=1), thrush (n=3), cold sores (n=2), mononucleosis (n=1), and upper respiratory infections (n=1).

- Twenty (95%) had a history of receiving routine childhood immunizations, including diphtheria, pertussis/whooping cough, tetanus, measles, rubella, mumps, polio, chicken pox, and hepatitis A & B.

- Three (14%) had a history of exposure to mononucleosis. Two of these involved exposure to siblings with mononucleosis.

13. Histories of Surgeries, Non-Routine X-Rays, Radiation Treatments, and Treatments for Head Lice Prior to Diagnosis

The information regarding reported histories of surgeries, non-routine x-rays, radiation treatments, and treatments for head lice prior to diagnosis is presented in Table 13:

- Thirteen of the children (62%) had no reported histories of surgeries prior to the diagnosis of cancer.

- Eight of the children (38%) had a history of some type of surgery prior to the cancer diagnosis. Six children (29%) had histories of removal of tonsils and/or adenoids. Two children (10%) had placements of ear tubes for ear infections. Two children (10%) also had surgery for removal of wisdom teeth. One child had a history of liver transplant. Other surgeries consisted of circumcision (n=1) and tightening of ankle ligaments (n=1).

- Ten children (48%) had histories of non-routine x-rays including Intravenous Pyelograms (IVP) (n=2), a radiography of the urethra and renal pelvis (n=2); x-rays for fractured bones (n=4); head x-ray (n=1); chest x-rays (n=1); pre-op x-rays for ankle surgery (n=1); x-rays of the liver as part of a transplant (n=1); and full-body x-rays after a car crash (n=1).

- All 21 children (100%) had no histories of radiation treatment.
- 19 of the children (91%) reported no treatments for head lice. Two cases had histories of being treated with Rid-X for head lice.

14. History of Use of Tobacco and Household Exposures to Environmental Tobacco Smoke Prior to Diagnosis

The reported data regarding the children's use of tobacco products and exposure to environmental tobacco smoke are presented in Table 14:

- All 21 children (100%) had no reported histories of use of tobacco products.

- Thirteen children (62%) had no reported histories of exposure to environmental tobacco smoke. Eight children (38%) had histories of exposure to environmental tobacco smoke including at home (n=5) and at the baby sitters' home (n=3).

15. Patient Use of Recreational Drugs and Alcoholic Beverages Prior to Cancer Diagnosis

All 21 children (100%) had no reported histories of use of recreational drugs or alcoholic beverages prior to diagnosis as presented in Table 15.

16. Histories of Use of Prescription and Over-the-Counter Medications within Three Years Prior to Diagnosis

There are extensive reported histories of use of prescription medications and over-the-counter medications for the children within the three years prior to diagnosis as indicated in Table 16:

- Fifteen of the children (71%) had a history of prescription medication use in the three years prior to the cancer diagnosis. These included: antibiotics, drugs to control transplant rejection, allergy control medications, seizure control medications, iron supplements, ringworm treatments, wart removal compounds, pain relievers, hyperactivity medications, and laxatives.

- Ten of the patients (48%) had a history of over-the-counter medications within three years prior to diagnosis. These included: children's cough, cold, and pain; allergy relief; and menstrual cramping medications.

NOTE: Only 20 of the 21 children with cancer had parents who completed the remaining questions.

17. Presence of Household Pets Prior to Diagnosis

- Sixteen of the children (80%) reported having a household pet prior to diagnosis as indicated in Table 17. The most frequently reported pet was a dog (n=16, 80%) followed by a cat (n=12, 60%). Most households had two pets or more. Other pets included rabbits, a hamster, turtles, birds, and rats.

- Thirteen of the 16 households with pets reported routinely treating the pets for fleas, typically with sprays and/or flea collars. In every instance it was reported that an adult household member applied the flea spray/powder.

18. Residence in Close Proximity to Industrial Site Prior to Diagnosis [Please note: "Industrial Site" was not defined in the questionnaire and was interpreted broadly among the participants].

- Ten of the households (50%) reported living in close proximity to an industrial site prior to the diagnosis of cancer as presented in Table 18. Two of the households reported living close to two industrial sites.

- Four of the households (20%) reported living close to a "large industrial site"; two lived close to an "old landfill". Three households (15%) lived close to a "chemical waste disposal site"; one lived close to a "trucking site, junkyard"; one close to a "light manufacturing plant," and one close to a "stone cutting" site.

- Seven of the 10 households were estimated to be one mile or less from the industrial site. Two households were unable to estimate a distance.

- Four of the households (20%) reported experiencing various odors and dusts from these sites. These consisted of "oil and chemical odors" (large industrial plant and old landfill); "burning, irritating, odors" (large industrial plant); "horrible smell" (large industrial plant, chemical waste disposal site); and "stone cutting dust" (stone cutting site).

19. Residence in Close Proximity to Cell Phone Towers, Electric Power Lines, and Cell Phone Usage Prior to Diagnosis

The information regarding residence in close proximity to cell phone towers, electric power lines, and cell phone usage prior to diagnosis is presented in Table 19:

- Four of the households (20%) reported living in close proximity to a cell phone tower prior to diagnosis. Their estimated distances were 0.5 miles or less. All four were different sites/types of cancer (brain & CNS, osteosarcoma, pancreas, and rhabdomyosarcoma).

- Two of the households (10%) reported that the child used a cell phone prior to diagnosis. These were two distinct cancer sites/types (brain & CNS, pancreas).

- Two of the households (10%) reported having electric power lines in close proximity to the home prior to diagnosis. The reported distances were one mile and 1,000 feet. Again, these were two different types of cancer (melanoma of skin, pancreas).

20. Presence of Ponds and Streams on Property of Residence and Related Activities Prior to Diagnosis.

The information regarding the presence of and activities related to ponds and streams on property of residence prior to diagnosis is presented in Table 20:

- Five of the households (25%) reported having a pond on the property of residence prior to diagnosis. Three of these households (15%) reported that the child waded, swam and/or fished in the pond. The frequency of these activities was described as "often," "seldom," and "sometimes" respectively.

- Eight of the households (40%) reported the presence of streams on their property of residence prior to diagnosis. Five of these households reported that the child waded, swam, played along the banks, or fished in the stream. The frequency of these activities was described as "seldom" (n=3); "often" (n=1); and "sometimes" (n=1). The children that engaged in activities involving streams on the property of residence had a diagnosis of brain & CNS (n=1); melanoma of skin (n=1); rhabdomyosarcoma (n=1); and leukemia (n=2).

21. Drinking Water Sources during Pregnancy and Birth to Time of Diagnosis

The information pertaining to drinking water sources during pregnancy with the case and from birth to diagnosis of cancer is presented in Table 21:

- Seven of the households (35%) reported having a private well as the primary drinking water source during the pregnancy with the child that developed cancer. This included all three children with leukemia, one child with melanoma of the skin, one child with brain & CNS cancer, one child with rhabdomyosarcoma, and the one child with thyroid cancer. All the other children with cancer had public water supplies as the primary drinking water source during pregnancy.

- Eighteen of the households (90%) reported having a public water supply as a secondary drinking water source during the pregnancy with the child that developed cancer. One (5%) reported a private well and one (5%) reported using bottled water as a secondary drinking water source during the pregnancy.

- Twelve of the households (60%) reported that the child had a private well as the primary drinking water source from birth to diagnosis. This includes all three children with leukemia, the one child with Ewing's Sarcoma, one of the children with melanoma of the skin, three of the children with brain & CNS cancer, two of the children with rhabdomyosarcoma, the one child with thyroid cancer, and the one child with osteosarcoma.

- Three of the households (15%) reported having a private well as the secondary drinking water source from birth to diagnosis. Seventeen (81%) reported a public water supply as their secondary drinking water source. One reported use of a cistern and one child was reportedly exclusively breast fed.

- In total 12 households (60%) had a private well as the primary drinking water source during the pregnancy or from birth to diagnosis. However, all of the private water well testing conducted by the Ohio EPA showed no cancer causing chemicals at levels that would present a health risk.[24,25,26]

22. Perceived Presence of Old Dumps/Waste Disposal Areas on Property of Residence Prior to Diagnosis

The information regarding the perceived presence of dumps/waste disposal areas on the property of residence prior to diagnosis is presented in Table 22:

- Four of the households (20%) reported that they had reason to believe that an old dump and/or waste disposal area was on their property of residence prior to diagnosis. This was reported for two of the children with rhabdomyosarcoma, one of the children with melanoma of the skin, and one of the children with brain & CNS cancer. The evidence reported included the findings of buried trash and broken glass, rumors that there was an old dump on the property, and for one household, a map that reportedly shows an old dump on the property.

- Three of these four households did not know of any potential exposures to the cases from these sites. One household reported that the child played outside near the site.

23. Tearing Down and/or Burning of Buildings/Structures on Property of Residence Prior to Diagnosis

The information regarding the tearing down and/or burning of buildings/structures on the property of residence prior to diagnosis is presented in Table 23:

- Four households (20%) reported having a building/structure torn down or burned on the property of residence prior to diagnosis. This included two of the children with brain & CNS cancer and both of the children with melanoma of the skin.

- One of the households with a child with brain & CNS cancer reported the collapse and further tearing down of an old barn. The debris from the barn remained on the property. The other household with a child with brain & CNS cancer reported tearing down a structure with unknown use. The debris was hauled away.

- One of the households with a child with melanoma of the skin reported that an old shed and corn crib were burned and the debris hauled away. Another household with a child with melanoma of the skin reported an old trailer was burned on the site.

24. Painting and Remodeling in the Home Prior to Diagnosis

Seven of the households (35%) related histories of painting/remodeling in the home prior to diagnosis as presented in Table 24. This included four of the children with brain & CNS cancer, one child with melanoma of the skin, one of the children with leukemia, and the child with osteosarcoma.

- Two of the children with brain & CNS cancer had scenarios of "built a new home" prior to diagnosis. Another child with brain & CNS cancer had a history of "periodic painting and wall papering" in the home, while a fourth child with brain & CNS cancer had a history of "renovating the attic" prior to diagnosis.

- The parents of one child with melanoma of the skin related a history of "building an additional room" prior to diagnosis.

- The parents of one of the children with leukemia reported a history of a "new garage and rooms" prior to diagnosis.

- The parents of the child with osteosarcoma reported a history of construction of a "new roof" prior to diagnosis.

25. Local Fish and Game Consumption Prior to Diagnosis

The information from the reported histories of the children's consumption of locally caught fish and game is presented in Table 25:

- Six of the children ate locally caught fish or game prior to diagnosis, but the frequency was less than once per month.

26. History of Fill-Dirt Ever Brought on to Property Prior to Diagnosis

The data from the reported histories of fill-dirt ever brought on to the property of residence prior to diagnosis are presented in Table 26:

- Five of the households (24%) reported histories of fill-dirt brought onto the property of residence prior to diagnosis.

- Two of the households with children with rhabdomyosarcoma, two of the households with children with brain & CNS cancer and one of the households with a child with melanoma of the skin reported having fill-dirt brought onto the property of residence prior to diagnosis.

- All five households reported using the fill-dirt for flower beds and/or the leveling of ground. Three of the five households reported having the fill-dirt placed all around the property.
- The source of the fill-dirt was reportedly from various places in the Clyde area and from nearby Seneca County.

27. Use of Wood-Burning Stoves and Fireplaces in the Home Prior to Diagnosis

The interview data pertaining to reported use of outside wood-burning stoves, inside wood-burning stoves, and fireplaces, and the sources of wood are presented in Table 27:

- Only one household reported use of an outside wood-burning stove. The reported source of wood was on the household property.

- Eight of the households (40%) reported use of inside wood-burning stoves or fireplaces. The reported sources of wood were on the household property in nearby woods.

- The sites/types of cancer from these households showed extensive variation. This included three of the children with brain & CNS cancer. One child with brain & CNS cancer reportedly had frequent visits to a grandfather's house where a wood-burning stove was the primary source of heat. The households of one of the children with leukemia, a child with rhabdomyosarcoma, a child with pancreatic cancer, a child with melanoma of the skin, and the child with Ewing's sarcoma reported use of inside wood-burning stoves or fireplaces that burned local wood.

28. Types of Fuels Used to Heat Homes Prior to Diagnosis

Information related to the types of fuels used to heat the homes of cases prior to diagnosis is presented in Table 28:

- Seventeen of the households (85%) reported a combination of fuels used to heat their homes prior to diagnosis. The reported fuels consisted of propane gas (n=12), natural gas (n=13), wood (n=8), electricity (n=4), and kerosene (n=2). One household reported not knowing how the home was heated.

- Thirteen of the households (65%) reported using propane gas and/or kerosene/fuel oil to heat their homes. Seven of the 13 (54%) reported that fuel storage tanks were outside and away from the house. Six of the 13 (46%) reported that the fuel storage tanks were outside and next to the house.

29. Storage of Solvents, Fuels, and Other Chemicals in the Living Area or Basement of Residence Prior to Diagnosis

The interview data regarding the storage of solvents, fuels, and other chemicals in the living area or basement of residence prior to diagnosis are presented in Table 29:

- Thirteen of the households (65%) reported keeping paints in the living area or the basement of the residence prior to diagnosis. This includes the residences of three of the children with leukemia, five of the children with brain & CNS cancer, the child with Ewing's sarcoma, the child with thyroid cancer, one of the children with Hodgkin's lymphoma, the child with osteosarcoma, and the child with pancreatic cancer.

- All 20 households (100%) denied keeping any cleaning supplies, fuels, solvents, or other chemicals in the living areas or basements prior to diagnosis.

30. Location of Child's Bedroom in Relation to Garage Prior to Diagnosis

Information was collected from the households pertaining to the presence of an attached or separate garage and the location of the child's bedroom in relation to the garage. This information is presented in Table 30:

- Nineteen (95%) of the households reported having an attached or separate garage prior to diagnosis. This included 12 households with an attached garage (60%) and seven households with a separate garage (35%). One household reported having no garage.

- One of the households (8%) reported that the child's bedroom was over the attached garage. Seven of these households (58%) with an attached garage reported that the child's bedroom was away from the garage. Four of the households (33%) could not determine where the child's bedroom was in relation to the garage. Three children had bedrooms on the first floor away from the garage and one child had a bedroom in the basement.

31. Use of Playgrounds and Parks Prior to Diagnosis

Information related to use of local playgrounds and parks prior to diagnosis is presented in Table 31:

- Eleven of the households (55%) reported the child's use of local playgrounds and parks prior to diagnosis. There was little consistency in the use of any park or a particular park by cancer site/type.

- Use of the following parks was reported: (a) East Side Park, Fremont (n=1, 5%); (b) Connor Park, Fremont (n=1, 5%); (c) Wee People Park, Castalia (n=1, 5%); (d) Green Springs Park, Green Springs (n=1, 5%); (e) Community Park, Clyde (n=9, 45%); (f) South Main School Park, Clyde (n=2, 10%); (g) Clyde High School Fields (n=1, 5%); and (g) McPherson Middle School Park, Clyde (n=1, 5%).

- The reported frequency of use of these playgrounds varied from seldom to sometimes.

DISCUSSION AND CONCLUSION

The causes of childhood cancer are an active and growing field of research. However, to date there has been limited success in identifying the cause of childhood cancer. Because of this, information from these questionnaires can only reveal the presence or absence of each risk factor or exposure. It is impossible to identify a cause-and-effect from any factor, even if that factor is present in many or most of the children. For the results of this analysis, we can only present the findings from each question to generate a better picture of those factors that may have increased the risk for developing childhood cancer among the participants.

Some of the limitations to this analysis need to be noted. First, only 60% of families with children with cancer in the area of study participated in the investigation. While this does not affect the responses from those who did participate, it makes any generalization of the data to all 35 children with cancer difficult. Second and as noted above, due to the nature of the investigation, it is not possible to determine significance of any finding, and due to the relatively small number of families involved, even findings that seem important may be due to chance rather than a true correlation between exposure and disease. Third, in order to capture a large amount of information, the decision was made to use the *Cancer Risk Factor Questionnaire for Cases 19 Years of Age and Younge*[4]*r* and *Supplemental Environmental Cancer Risk Factor Questionnaire for Cases 19 Years and Younger*[5] to capture information on known, suspect, and potential risk factors for childhood cancer. Therefore results can only be used as one piece of a broader data picture. Fourth, all retrospective analyses (looking at events that happened in the past) suffer from various forms of bias (circumstances which may inappropriately influence the data). One of the most common forms of bias is called recall bias and occurs when the recall of information from the past is difficult or influenced by other events. In some cases families were asked to remember small details that happened almost a decade ago. Lastly, the questions asked were concerning events during the time when the lives of the families were focused on the health of their children, and details are more likely to be missed or remembered incorrectly.

Based on the data collected from the families it is the conclusion of this assessment that there were no exposures or variables that were common to the 21 children with cancer who participated in this profile.

RECOMMENDATIONS

(1) Share the results of this profile with the parents of the children with cancer.

(2) Post this profile report on the SCHD and ODH Web sites.

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Table 1

Line Listing of Participating and Non Participating Children in Eastern Sandusky County Childhood Cancer Profile, 1996-2010, N=35[1]

Participating in Profile (n=21)

Case Number	Case Site/Type	Age at Diagnosis	Year of Diagnosis	Gender
1.	Leukemia	<5	1996	Male
2.	Brain & CNS[2]	<5	1996	Female
3.	Ewing's Sarcoma	15-19	1997	Female
4.	Brain & CNS	5-9	2001	Female
5.	Melanoma of Skin	15-19	2001	Female
6.	Brain & CNS	5-9	2001	Male
7.	Rhabdomyosarcoma	10-14	2003	Female
8.	Thyroid	15-19	2004	Female
9.	Hodgkin's Lymphoma	10-14	2005	Male
10.	Brain & CNS	<5	2005	Male
11.	Brain & CNS	10-14	2005	Male
12.	Rhabdomyosarcoma	<5	2006	Male
13.	Leukemia	10-14	2006	Female
14.	Hodgkin's Lymphoma	10-14	2006	Male
15.	Brain & CNS	5-9	2006	Female
16.	Melanoma of Skin	<5	2006	Female
17.	Osteosarcoma	15-19	2006	Female
18.	Pancreas	15-19	2008	Female
19.	Leukemia	10-14	2008	Male
20.	Brain & CNS	10-14	2009	Male
21.	Rhabdomyosarcoma	5-9	2010	Female

Range in Age: <1 to 19 years
Mean Age: 10 years
Not Participating in Profile (n=14)[3]

• Oral	15-19	1998	Female
• Osteosarcoma	5-9	1998	Female
• Leukemia	5-9	1998	Male
• Soft Tissue	15-19	2000	Male
• Kidney	<5	2000	Female
• Liver	<5	2001	Female
• Leukemia	15-19	2001	Male
• Leukemia	15-19	2003	Male
• Leukemia	<5	2003	Female

Continued on page 28

Range in Age: <1 to 19 years
Mean Age: 10 years

Case Site/Type	Age at Diagnosis	Year of Diagnosis	Gender
• Ovary	15-19	2005	Female
• Leukemia	5-9	2006	Female
• Ewing's Sarcoma	15-19	2006	Female
• Non-Hodgkin's Lymphoma	5-9	2006	Male
• Testes	15-19	2006	Male

Range in Age: <1 to 19 years
Mean Age: 10 years

[1]Source: Sandusky County Health Department; Comprehensive Cancer Control Program, Office of Healthy Ohio, Ohio Department of Health, 2010
[2](CNS) = Central Nervous System
[3]Case parents declined to participate or were lost to follow-up; i.e. unable to establish contact

Table 2

Blood Relatives with Cancer Diagnosis: Eastern Sandusky County Childhood Cancer Profile, 1996-2010, n=21[1]

Case	Number of Blood Relatives with Cancer[2]	Sites/Types of Cancer	Same Site/Type as Case?
1. Leukemia	4	Breast, multiple myeloma, breast/bone, melanoma	No
2. Brain & CNS[3]	6	Thyroid, bladder/prostate, bladder, prostate, lung, lymphoma	No
3. Ewing's Sarcoma	4	Lung, breast, breast, brain & CNS	No
4. Brain & CNS	4	Breast, breast, bone, esophagus	No
5. Melanoma of Skin	2	Breast, colorectal/prostate	No
6. Brain & CNS	2	Leukemia/breast, brain &CNS	Yes
7. Rhabdomyosarcoma	3	Breast, testicular, colorectal	No
8. Thyroid	5	Ovarian, lung, lung, spleen, lymphoma	No
9. Hodgkin's Lymphoma	2	Unknown site/type, leukemia	Unknown
10. Brain & CNS	2	Melanoma, leukemia	No
11. Brain & CNS	1	Bone	No
12. Rhabdomyosarcoma	9	Throat, cervical, cervical, cervical, blood, uterine, lung , stomach, leukemia	No
13. Leukemia	8	Bladder, skin, skin, bone, uterine, pancreas, uterine, leukemia	Yes
14. Hodgkin's Lymphoma	2	Cervical, liver/pancreas	No
15. Brain & CNS	2	Melanoma/brain, colorectal/liver	Yes
16. Melanoma of Skin	3	Skin, lymphoma, brain & CNS	Yes
17. Osteosarcoma	2	Tonsils, bladder	No
18. Pancreas	4	Brain & CNS, prostate, larynx, brain & CNS	No
19. Leukemia	7	Leukemia, bladder, skin, bone, uterine, uterine, pancreas	Yes
20. Brain & CNS	2	Unknown site/type, unknown site/type	Unknown
21. Rhabdomyosarcoma	2	Stomach, lung	No
TOTAL	**76**		

This indicates an average of 3.6 blood relatives with a history of cancer per case.

[1]Source: Sandusky County Health Department; Comprehensive Cancer Control Program, Office of Healthy Ohio, Ohio Department of Health, 2010

[2]These cases were not verified as to diagnosis of cancer.

[3]CNS = Central Nervous System

Table 3

Estimated Years of Life and Percent of Total Life of Residence in Eastern Sandusky County Prior to Cancer Diagnosis: Eastern Sandusky County Childhood Cancer Profile, 1996-2010, n=21[1]

Case	Estimated Percent of Total Life[3]
1. Leukemia	100%
2. Brain & CNS[4]	100%
3. Ewing's Sarcoma	90%
4. Brain & CNS	100%
5. Melanoma of Skin	100%
6. Brain & CNS	100%
7. Rhabdomyosarcoma	100%
8. Thyroid	100%
9. Hodgkin's Lymphoma	100%
10. Brain & CNS	84%
11. Brain & CNS	85%
12. Rhabdomyosarcoma	100%
13. Leukemia	100%
14. Hodgkin's Lymphoma	29%
15. Brain & CNS	53%
16. Melanoma of Skin	100%
17. Osteosarcoma	35%
18. Pancreas	100%
19. Leukemia	100%
20. Brain & CNS	51 %
21. Rhabdomyosarcoma	87%

Range = 29% (0.7 years) - 100% (19.5 years)
Mean = 86% (8.6 years)

[1]Source: Sandusky County Health Department; Comprehensive Cancer Control Program, Office of Healthy Ohio, Ohio Department of Health, 2010.
[2]Estimated Years of Life in Eastern Sandusky County determined using case birth date, residential history, and date of diagnosis.
[3]Estimated percent of total life was determined using case birth date, date of diagnosis, and residential history.
[4]CNS= Central Nervous System.

Table 4

Parental Work Histories and Potential Exposures to Chemicals, Infectious Agents, or Radiation Prior to Diagnosis: Eastern Sandusky County Childhood Cancer Profile, 1996-2010, n=21[1]

Case No.	Maternal Exposure	Paternal Exposure
1. Leukemia	None	None known
2. Brain & CNS[2]	Environmental Tobacco Smoke	Farm chemicals
3. Ewing's Sarcoma	None	None known
4. Brain & CNS	Possible infectious agents in school class room setting, pesticides at farmer's market	Herbicides, insecticides Fungicides, ammonia, gasoline fumes
5. Melanoma of Skin	None	Treated lumber, construction exposures, e.g. dust
6. Brain & CNS	Black mold	Paint thinners, acetone, solvents, ammonia, fertilizer, pesticides
7. Rhabdomyosarcoma	None	Lead, pesticides
8. Thyroid	Cleaning products, solutions, dry-cleaning products	None known
9. Hodgkin's Lymphoma	None	Unknown
10. Brain & CNS	Latex paint	Tar, oil base paint, pesticides
11. Brain & CNS	None	Unknown
12. Rhabdomyosarcoma	None	Herbicides, insecticides, fungicides, fertilizers
13. Leukemia	Grease and glue in manufacturing	Electrical transformer oils
14. Hodgkin's Lymphoma	Formalin, acetone in medical setting	Paints, solvents, drywall, dusts, gasoline, petroleum products
15. Brain & CNS	None	Molds, pesticides, paints
16. Melanoma of Skin	Pesticides, formaldehyde, cleaning solutions, asbestos, fiberglass	Concrete dust
17. Osteosarcoma	None	None
18. Pancreas	Hazardous waste with protective clothing	Farm chemicals
19. Leukemia	Paints, glues, oils, grease in manufacturing	None
20. Brain & CNS	None	None known
21. Rhabdomyosarcoma	Possible infectious agents in patient care setting, plastics in recycling	Plastics in recycling

[1]Source: Sandusky County Health Department; Comprehensive Cancer Control Program, Office of Healthy Ohio, Ohio Department of Health, 2010

[2]CNS = Central Nervous System

Table 5

Estimated Month of Conception and Age of Mother at Conception: Eastern Sandusky County Childhood Cancer Profile, 1996-2010, n=21[1]

Case	Estimated Month of Conception	Calendar Quarter for Conception[2]	Age of Mother at Conception (years)
1. Leukemia	October	4	35
2. Brain & CNS[3]	January	1	35
3. Ewing's Sarcoma	January	1	22
4. Brain & CNS	March	1	31
5. Melanoma of Skin	April	2	27
6. Brain & CNS	July	3	17
7. Rhabdomyosarcoma	May	2	26
8. Thyroid	September	3	20
9. Hodgkin's Lymphoma	August	3	17
10. Brain & CNS	July	3	23
11. Brain & CNS	April	2	18
12. Rhabdomyosarcoma	April	2	17
13. Leukemia	June	2	25
14. Hodgkin's Lymphoma	August	3	18
15. Brain & CNS	May	2	38
16. Melanoma of Skin	June	2	29
17. Osteosarcoma	February	1	21
18. Pancreas	April	2	25
19. Leukemia	November	4	30
20. Brain & CNS	September	3	37
21. Rhabdomyosarcoma	April	2	18

1 = 4 (19%)
2 = 9 (43%)
3 = 6 (29%)
4 = 2 (10%)

Range = 17 to 38 years
Mean = 25 years

[1]Source: Sandusky County Health Department; Comprehensive Cancer Control Program, Office of Healthy Ohio, Ohio Department of Health, 2010.
[2]Calendar Quarters: January – March = 1, April – June = 2, July – September =3, October – December = 4.
[3]CNS = Central Nervous System.

Table 6

Maternal Infectious Disease/Illness and Medication Use During Pregnancy with Case: Eastern Sandusky County Childhood Cancer Profile, 1996-2010, n=21[1]

Case	Infectious Disease/Illness During Pregnancy	Medication Use During Pregnancy
1. Leukemia	No	Yes; Tylenol, Prenatal Vitamins
2. Brain & CNS[2]	No	Yes; Prenatal Vitamins, Iron Supplement
3. Ewing's Sarcoma	No	Yes; Prenatal Vitamins
4. Brain & CNS	No	Yes; Tylenol, Prenatal Vitamins
5. Melanoma of Skin	No	Yes; Prenatal Vitamins
6. Brain & CNS	Yes, chest cold	Yes, Medral Dose Pack, Prescription cough medicine
7. Rhabdomyosarcoma	Yes, Toxemia	Yes; Tylenol, Prenatal Vitamins
8. Thyroid	No	Yes; Prenatal vitamins
9. Hodgkin's Lymphoma	Yes, vaginal/uterine infection	Yes; Prenatal vitamins
10. Brain & CNS	No	Yes; Tylenol, Prenatal Vitamins
11. Brain & CNS	Yes, Toxemia	Yes; Prenatal vitamins
12. Rhabdomyosarcoma	No	Yes; Prenatal vitamins
13. Leukemia	No	Yes; Prenatal vitamins
14. Hodgkin's Lymphoma	Yes, pneumonia	Yes; Prenatal vitamins, Gaviscon
15. Brain & CNS	No	No
16. Melanoma of Skin	Yes, Strep B+	Yes; Prenatal vitamins
17. Osteosarcoma	No	Don't Know
18. Pancreas	No	Yes; Tylenol
19. Leukemia	No	Yes; Prenatal vitamins
20. Brain & CNS	No	Don't know
21. Rhabdomyosarcoma	No	No

Yes = 6 (29%)
No = 15 (71%)

Yes = 17 (81%)
No = 2 (10%)
Don't know = 2 (10%)

[1]Source: Sandusky County Health Department; Comprehensive Cancer Control Program, Office of Healthy Ohio, Ohio Department of Health, 2010.
[2]CNS= Central Nervous System

Table 7

Maternal Smoking and Exposure to Environmental Tobacco Smoke at Home/Work during Pregnancy with Case: Eastern Sandusky County Childhood Cancer Profile, 1996-2010, n=21[1]

Case	Maternal Smoking	Exposure to Environmental Tobacco Smoke
1. Leukemia	No	Yes; at work
2. Brain & CNS[2]	No	No
3. Ewing's Sarcoma	No	No
4. Brain & CNS	No	No
5. Melanoma of Skin	No	No
6. Brain & CNS	No	Yes; at home
7. Rhabdomyosarcoma	No	No
8. Thyroid	No	Yes; at work
9. Hodgkin's Lymphoma	No	Yes; at home
10. Brain & CNS	No	No
11. Brain & CNS	No	No
12. Rhabdomyosarcoma	No	No
13. Leukemia	No	Yes; at work
14. Hodgkin's Lymphoma	Yes	Yes; at home and work
15. Brain & CNS	No	No
16. Melanoma of Skin	Yes	Yes; at home
17. Osteosarcoma	No	No
18. Pancreas	No	Yes; at work
19. Leukemia	No	No
20. Brain & CNS	No	No
21. Rhabdomyosarcoma	Yes	Yes; at work
	Yes = 3 (14%) No = 18 (86%)	Yes = 9 (43%) No = 12 (57%)

[1]Source: Sandusky County Health Department; Comprehensive Cancer Control Program, Office of Healthy Ohio, Ohio Department of Health, 2010.
[2]CNS= Central Nervous System

Table 8

Maternal Use of Recreational Drugs, Consumption of Alcoholic Beverages, and Home Extermination during Pregnancy with Case: Eastern Sandusky County Childhood Cancer Profile, 1996-2010, n=21[1]

Case	Recreational Drugs	Alcoholic Beverages	Home Extermination
1. Leukemia	No	No	No
2. Brain & CNS[2]	No	No	No
3. Ewing's Sarcoma	No	No	Yes, insect bomb
4. Brain & CNS	No	No	No
5. Melanoma of Skin	No	No	No
6. Brain & CNS	No	No	No
7. Rhabdomyosarcoma	No	No	No
8. Thyroid	No	No	No
9. Hodgkin's Lymphoma	No	No	No
10. Brain & CNS	No	No	No
11. Brain & CNS	No	No	No
12. Rhabdomyosarcoma	No	No	No
13. Leukemia	No	No	Yes, insect bomb
14. Hodgkin's Lymphoma	No	No	No
15. Brain & CNS	No	No	No
16. Melanoma of Skin	No	No	No
17. Osteosarcoma	No	No	Don't know
18. Pancreas	No	No	No
19. Leukemia	No	No	No
20. Brain & CNS	No	No	Don't know
21. Rhabdomyosarcoma	No	No	No
	Yes = 0 (0%) No = 21 (100%)	Yes = 0 (0%) No = 21 (100%)	Yes = 2 (10%) No = 17 (81%) Don't know = 2 (10%)

[1]Source: Sandusky County Health Department; Comprehensive Cancer Control Program, Office of Healthy Ohio, Ohio Department of Health, 2010.
[2]CNS= Central Nervous System

Table 9

Maternal Exposure during Pregnancy with Case to Paints, Cleaning Supplies, Fuels, Solvents, or Other Chemicals: Eastern Sandusky County Childhood Cancer Profile, 1996-2010, n=21[1]

Case	Paints	Cleaning Supplies	Fuels	Solvents	Other Chemicals
1. Leukemia	No	No	No	No	No
2. Brain & CNS[2]	No	No	Yes[3]	No	No
3. Ewing's Sarcoma	Yes[4]	No	No	No	No
4. Brain & CNS	No	No	No	No	Yes[5]
5. Melanoma of Skin	Yes[4]	No	No	No	No
6. Brain & CNS	No	No	Yes[3]	No	No
7. Rhabdomyosarcoma	No	No	No	No	No
8. Thyroid	No	No	No	No	No
9. Hodgkin's Lymphoma	No	No	No	No	No
10. Brain & CNS	Yes[4]	No	No	No	No
11. Brain & CNS	No	No	No	No	No
12. Rhabdomyosarcoma	No	No	No	No	Yes[6]
13. Leukemia	No	No	No	No	Yes[6]
14. Hodgkin's Lymphoma	No	No	No	No	Yes[7]
15. Brain & CNS	Yes[4]	No	No	No	Yes[6]
16. Melanoma of Skin	No	No	Yes[3]	No	Yes[8]
17. Osteosarcoma	Don't know	No	Don't know	Don't know	Don't know
18. Pancreas	No	No	No	No	No
19. Leukemia	Yes[9]	No	No	Yes[9]	Yes[9]
20. Brain & CNS	No	No	No	No	No
21. Rhabdomyosarcoma	Yes[9]	No	No	Yes[9]	Yes[9]
	Yes=6 (29%) No=14 (67%) Don't know = 1(5%)	Yes=0 (0%) No=21 (100%)	Yes=3 (14%) No=17 (81%) Don't know = 1 (5%)	Yes=2 (10%) No=18 (86%) Don't know = 1 (5%)	Yes=8 (38%) No=12 57%) Don't know = 1 (5%)

[1]Source: Sandusky County Health Department; Comprehensive Cancer Control Program, Office of Healthy Ohio, Ohio Department of Health, 2010.
[2]CNS= Central Nervous System
[3]Propane gas
[4]Once or twice at home
[5]Secondary exposure to pesticides via handling fruits and vegetables
[6]Hair Dye
[7]Possible radiation exposure in medical setting
[8]Swimming pool chlorine
[9]Grease, paints, solvents in manufacturing plant

Table 10

Birth Weight of Cases and History of Breast Feeding: Eastern Sandusky County Childhood Cancer Profile, 1996-2010, n=21[1]

Case	Birth Weight	Breast Fed
1. Leukemia	7 lb. 4 oz.	Yes
2. Brain & CNS[2]	7 lb. 10 oz.	Yes
3. Ewing's Sarcoma	8 lb. 3 oz.	Yes
4. Brain & CNS	7 lb. 5 oz.	Yes
5. Melanoma of Skin	8 lb. 2 oz.	Yes
6. Brain & CNS	8 lb. 2 oz.	Yes
7. Rhabdomyosarcoma	7 lb. 4 oz.	No
8. Thyroid	7 lb. 11 oz.	No
9. Hodgkin's Lymphoma	7 lb. 5 oz.	No
10. Brain & CNS	8 lb. 4 oz.	Yes
11. Brain & CNS	5 lb. 6 oz.	Yes
12. Rhabdomyosarcoma	6 lb. 1 oz.	No
13. Leukemia	6 lb. 12 oz.	Yes
14. Hodgkin's Lymphoma	7 lb. 6 oz.	No
15. Brain & CNS	7 lb. 5 oz.	Yes
16. Melanoma of Skin	7 lb. 3 oz.	No
17. Osteosarcoma	7 lb. 12 oz.	Unknown
18. Pancreas	7 lb. 11 oz.	Yes
19. Leukemia	7 lb. 4 oz.	Yes
20. Brain & CNS	7 lb. 9 oz.	Yes
21. Rhabdomyosarcoma	6 lb. 5 oz.	No

Range = 5 lb. 6 oz. – 8 lb. 4 oz.
Mean = 7 lb. 5 oz.

Yes = 13 (62%)
No = 7 (33%)
Unknown=1 (5%)

[1]Source: Sandusky County Health Department; Comprehensive Cancer Control Program, Office of Healthy Ohio, Ohio Department of Health, 2010.
[2]CNS= Central Nervous System

Table 11

Health Problems, Diagnosis of Birth Defects and/or Hereditary Disease, and/or Treatments at Birth or Within Six Months after Birth: Eastern Sandusky County Childhood Cancer Profile, 1996-2010, n=21[1]

Case	Health Problems[2]	Birth Defects/Hereditary Disease[3]	Treatments[4]
1. Leukemia	No	No	No
2. Brain & CNS[5]	Yes; Respiratory Syncytial Virus (RSV)[6], Chicken Pox	No	No
3. Ewing's Sarcoma	No	Yes; Webbed toes	No
4. Brain & CNS	No	No	No
5. Melanoma of Skin	No	No	No
6. Brain & CNS	Yes; jaundice, thrush[7], ear infection	No	Yes; antibiotics
7. Rhabdomyosarcoma	Yes; jaundice, moderate to severe reflux with vomiting	No	Yes; UV lights for jaundice
8. Thyroid	No	No	No
9. Hodgkin's Lymphoma	Yes; jaundice, resuscitation at birth	No	Yes; UV lights for jaundice
10. Brain & CNS	No	No	No
11. Brain & CNS	No	No	No
12. Rhabdomyosarcoma	Yes; RSV	No	Yes; oxygen at birth; Amoxicillin
13. Leukemia	Yes; Emergency C-section, cord around arm; low heart rate; thrush; RSV	Yes, cardio-myopathy gene	No
14. Hodgkin's Lymphoma	Yes; jaundice	No	No
15. Brain & CNS	No	No	No
16. Melanoma of Skin	Yes; Epileptic Forme Seizures; colds, allergies; formula intolerance; allergic colitis	No	No
17. Osteosarcoma	Don't know	No	Don't know
18. Pancreas	Yes; Thrush	No	Yes; antibiotics for oral thrush
19. Leukemia	No	No	Yes; Oxygen, respirator
20. Brain & CNS	No	No	No
21. Rhabdomyosarcoma	Yes; Upper respiratory infection	No	Yes; antibiotics for upper respiratory infection

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Yes=10 (48%)	Yes=2 (10%)	Yes=7 (33%)
No=10 (48%)	No=19 (90%)	No=13 (62%)
Don't know=1 (5%)		Don't know=1 (5%)

[1]Source: Sandusky County Health Department; Comprehensive Cancer Control Program, Office of Healthy Ohio, Ohio Department of Health, 2010.
[2]Including jaundice, diarrhea and/or vomiting, infection, other.
[3]Including Down 's syndrome, Klinefelter's Syndrome, Fanconi Anemia, Bloom's Syndrome, Turner's Syndrome, Li-Fraumeni Syndrome, other.
[4]Including UV lights for jaundice, oxygen/respirator, blood transfusion, medication, other.
[5]CNS= Central Nervous System.
[6]Respiratory syncytial virus is a major cause of lower respiratory infections in infants.
[7]Infection of the mucosa of the mouth caused by *Candida albicans*. In patients with healthy immune systems, thrush occurs when the balance of normal flora is destroyed during antibiotic therapy or following the use of corticosteroid-based inhalers, which suppress normal white blood cell function in the mouth. Thrush is also common in patients receiving immunosuppressive therapy for organ transplants; in cancer patients; and in those with acquired immunodeficiency syndrome; in who oral candida infection may be chronic. Occasionally healthy neonates, and persons who wear dentures develop thrush.

Table 12

Case History of Infectious Disease, Immunizations, and Exposure to Mononucleosis Prior to Cancer Diagnosis: Eastern Sandusky County Childhood Cancer Profile, 1996-2010, n=21[1]

Case	Infectious Disease[2]	Routine Childhood Immunizations[3]	Exposure to Mononucleosis[4]
1. Leukemia	No	Yes	No
2. Brain & CNS[5]	Yes; Chicken pox, Respiratory Syncytial Virus (RSV)[6]	Yes	No
3. Ewing's Sarcoma	Yes; Chicken pox, Epstein Barr Virus[7]	Yes	No
4. Brain & CNS	Yes; Chicken pox	Yes	No
5. Melanoma of Skin	Yes; Chicken pox	Yes	Yes; sibling
6. Brain & CNS	Yes; Chicken pox, thrush	Yes	No
7. Rhabdomyosarcoma	Yes; Chicken pox	Yes	No
8. Thyroid	Yes; Chicken pox	Yes	No
9. Hodgkin's Lymphoma	Yes; Chicken pox	Yes	No
10. Brain & CNS	Yes, Rotavirus[8]	Yes	No
11. Brain & CNS	Yes; Chicken pox	Yes	No
12. Rhabdomyosarcoma	Yes, RSV	Yes	No
13. Leukemia	Yes; Thrush, RSV, chicken pox, cold sores, mononucleosis	Yes	Yes
14. Hodgkin's Lymphoma	Yes; Chicken pox	Yes	No
15. Brain & CNS	No	Yes	No
16. Melanoma of Skin	No	Yes	No
17. Osteosarcoma	No	Yes	No
18. Pancreas	Yes; Chicken pox, cold sores, thrush	Yes	No
19. Leukemia	No	Yes	Yes; sibling
20. Brain & CNS	Yes; Chicken pox	No	Don't know
21. Rhabdomyosarcoma	Yes; Upper respiratory infection	Yes	No
	Yes = 16 (76%) No = 5 (24%)	Yes = 20 (95%) No = 1 (5%)	Yes = 3 (14%) No = 17 (81%) Don't Know=1 (5%)

[1]Source: Sandusky County Health Department; Comprehensive Cancer Control Program, Office of Healthy Ohio, Ohio Department of Health, 2010.

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[2]Includes: Diphtheria; Pertusis/whooping cough; Tetanus; Measles; Rubella (German Measles); Mumps; Polio; small pox; chicken pox; Hepatitis A, B, and C; cold sores (Herpes Simplex); Rheumatic fever; Mononucleosis

[3]Includes: Diphtheria; Pertusis/whooping cough; Tetanus; Measles; Rubella (German Measles); mumps; Polio; chicken pox; Hepatitis A & B

[4]Mononucleosis: An acute infectious disease caused by the Epstein-Barr virus, resulting in the presence of an abnormally high number of mononuclear leukocytes in the blood

[5]CNS= Central Nervous System

[6]Respiratory Syncytial virus (RSV) is a major cause of lower respiratory infections in infants

[7]Epstein-Barr virus is a member of the herpes virus family. It is one of the causes of infectious mononucleosis. In South African children it is associated with Burkitt's lymphoma; in Asian populations, with nasopharyngeal cancer.

[8]Rotaviruses are a group of viruses that worldwide are the most common cause of dehydrating diarrhea in children. The incubation period of the disease is short (1 to 3 days) and the transmission is via the fecal-oral route.

Table 13

History of Surgery, Non-Routine X-Rays, Radiation Treatment, and Treatment for Head Lice Prior to Diagnosis: Eastern Sandusky County Childhood Cancer Profile, 1996-2010, n=21[1]

Case	History of Surgery[2]	Non-Routine X-Rays[3]	Radiation Treatment	Treated for Head Lice
1. Leukemia	No	No	No	No
2. Brain & CNS[4]	No	No	No	No
3. Ewing's Sarcoma	Yes; Tonsils and adenoids removed	Yes; IVP,[5] arm x-ray	No	No
4. Brain & CNS	No	No	No	No
5. Melanoma of Skin	Yes; Adenoids removed	Yes; IVP	No	No
6. Brain & CNS	No	Yes; Head x-ray	No	No
7. Rhabdomyosarcoma	No	Yes; Arm x-ray	No	No
8. Thyroid	No	No	No	Yes, Rid-X
9. Hodgkin's Lymphoma	Yes; Liver transplant, ear tubes, tonsils/ adenoids removed	Yes; Liver	No	No
10. Brain & CNS	No	No	No	No
11. Brain & CNS	Yes; Circumcision	Yes; Wrist	No	No
12. Rhabdomyosarcoma	No	No	No	No
13. Leukemia	No	No	No	No
14. Hodgkin's Lymphoma	Yes; Ear tubes, tonsils/ adenoids removed	Yes, Thumb	No	No
15. Brain & CNS	No	No	No	No
16. Melanoma of Skin	No	Yes; Chest x-ray	No	No
17. Osteosarcoma	Yes; Oral surgery for wisdom teeth	Yes; Total body x-rays after auto crash	No	No
18. Pancreas	Yes; Oral surgery for wisdom teeth, tightening of ankle ligaments, tonsils/ adenoids removed	Yes; Pre-ops for ankle surgery	No	No
19. Leukemia	Yes; Tonsils/ adenoids removed	No	No	No
20. Brain & CNS	No	No	No	No
21. Rhabdomyosarcoma	No	No	No	Yes, Rid-X

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Yes=8 (38%)	Yes=10 (48%)	Yes=0 (0%)	Yes=2 (10%)
No=13 (62%)	No=11 (52%)	No=21 (100%)	No=19 (90%)

[1]Source: Sandusky County Health Department; Comprehensive Cancer Control Program, Office of Healthy Ohio, Ohio Department of Health, 2010.
[2]Includes: Removing tonsils and adenoids; removal of appendix; heart valve repair; insertion of ear tubes, etc.
[3]As a result of injury, trauma, heart imaging, etc. Dental x-rays not included
[4]CNS= Central Nervous System
[5]IVP=Intravenous Pyelogram (a radiograph of the urethra and renal pelvis)

Table 14

Case Use of Tobacco Products and Household Exposure to Environmental Tobacco Smoke Prior to Diagnosis: Eastern Sandusky County Childhood Cancer Profile, 1996-2010, n=21[1]

Case	Use of Tobacco Products	Exposure to Environmental Tobacco Smoke
1. Leukemia	No	No
2. Brain & CNS[2]	No	No
3. Ewing's Sarcoma	No	No
4. Brain & CNS	No	Yes, at baby sitter's
5. Melanoma of Skin	No	No
6. Brain & CNS	No	No
7. Rhabdomyosarcoma	No	No
8. Thyroid	No	Yes, at baby sitter's
9. Hodgkin's Lymphoma	No	Yes, at home
10. Brain & CNS	No	No
11. Brain & CNS	No	No
12. Rhabdomyosarcoma	No	No
13. Leukemia	No	Yes, at baby sitter's
14. Hodgkin's Lymphoma	No	Yes, at home
15. Brain & CNS	No	No
16. Melanoma of Skin	No	Yes, at home
17. Osteosarcoma	No	Yes, at home
18. Pancreas	No	No
19. Leukemia	No	No
20. Brain & CNS	No	No
21. Rhabdomyosarcoma	No	Yes, at home
	Yes = 0 (0%)	Yes = 8 (38%)
	No = 21 (100%)	No = 13 (62%)

[1]Source: Sandusky County Health Department; Comprehensive Cancer Control Program, Office of Healthy Ohio, Ohio Department of Health, 2010.
[2]CNS= Central Nervous System

Table 15

Case Use of Recreational Drugs and Alcoholic Beverages Prior to Diagnosis: Eastern Sandusky County Childhood Cancer Profile, 1996-2010, n=21[1]

Case	Recreational Drugs	Alcoholic Beverages
1. Leukemia	No	No
2. Brain & CNS[2]	No	No
3. Ewing's Sarcoma	No	No
4. Brain & CNS	No	No
5. Melanoma of Skin	No	No
6. Brain & CNS	No	No
7. Rhabdomyosarcoma	No	No
8. Thyroid	No	No
9. Hodgkin's Lymphoma	No	No
10. Brain & CNS	No	No
11. Brain & CNS	No	No
12. Rhabdomyosarcoma	No	No
13. Leukemia	No	No
14. Hodgkin's Lymphoma	No	No
15. Brain & CNS	No	No
16. Melanoma of Skin	No	No
17. Osteosarcoma	No	No
18. Pancreas	No	No
19. Leukemia	No	No
20. Brain & CNS	No	No
21. Rhabdomyosarcoma	No	No
	No = 21 (100%)	No = 21 (100%)

[1]Source: Sandusky County Health Department; Comprehensive Cancer Control Program, Office of Healthy Ohio, Ohio Department of Health, 2010.
[2]CNS= Central Nervous System

Table 16

Case Use of Prescription and Over-the-Counter Medications within Three Years Prior to Diagnosis: Eastern Sandusky County Childhood Cancer Profile, 1996-2010, n=21[1]

Case	Prescription Medications	Over-the-Counter Medications
1. Leukemia	No	No
2. Brain & CNS[2]	No	No
3. Ewing's Sarcoma	No	No
4. Brain & CNS	Yes; Antibiotics	No
5. Melanoma of Skin	Yes; Antibiotics	No
6. Brain & CNS	Yes; Antibiotics, Kondac	Yes; Children's pain relievers
7. Rhabdomyosarcoma	Yes; Amoxicillin, antihistamines, anti-seizure medications, pain relievers	Yes; Children's cough syrup, children's pain relievers
8. Thyroid	No	Yes; Menstrual cramp relief
9. Hodgkin's Lymphoma	Yes; Anti-rejection medications for transplant	Yes; Allergy relief
10. Brain & CNS	No	Yes; Pain relief
11. Brain & CNS	Yes; hyperactivity medications, antibiotics	No
12. Rhabdomyosarcoma	Yes; Antibiotics	Yes; Pain relief
13. Leukemia	Yes; Antibiotics for strep throat, compounds for wart removal	Yes; Pain relief
14. Hodgkin's Lymphoma	Yes; Allergy relief	Yes; Allergy relief
15. Brain & CNS	No	No
16. Melanoma of Skin	Yes; Anti-seizure medication, antibiotics, asthma/allergy relief, laxatives, iron supplements	Yes; Pain relief
17. Osteosarcoma	Yes; Antibiotics	No
18. Pancreas	Yes; Antibiotics, pain medication, acne medication	Yes; Pain relief
19. Leukemia	Yes; Allergy relief	No
20. Brain & CNS	Yes; Ringworm medication	No
21. Rhabdomyosarcoma	Yes; Antibiotics	No
	Yes= 15 (71%) No= 6 (29%)	Yes=10 (48%) No= 11 (52%)

Continued on page 47

[1]Source: Sandusky County Health Department; Comprehensive Cancer Control Program, Office of Healthy Ohio, Ohio Department of Health, 2010.
[2]CNS= Central Nervous System

Table 17

Presence of Household Pets Prior to Diagnosis: Eastern Sandusky County Childhood Cancer Profile, 1996-2010, n=20[1]

Case	Household Pet	Treatment for Fleas
1. Leukemia	No	N.A[2]
2. Brain & CNS[3]	No	N. A.
3. Ewing's Sarcoma	Yes[4]	Flea Collar[11]
4. Brain & CNS	Yes[4,5,6]	No
5. Melanoma of Skin	Yes[4,5, 7,8]	Flea Powder[11]
6. Brain & CNS	Yes[4]	Flea Spray[11]
7. Rhabdomyosarcoma	Yes[4]	Flea Spray[11]
8. Thyroid	No	N. A.
9. Hodgkin's Lymphoma	Yes[4]	Flea Spray, Collar[11]
10. Brain & CNS	No	N. A.
11. Brain & CNS	Yes[4,5]	Flea Spray, Collar[11]
12. Rhabdomyosarcoma	Yes[4,5]	No
13. Leukemia	Yes[4,5]	Flea Spray, Collar[11]
15. Brain & CNS	Yes[4,5]	Flea Spray, Collar[11]
16. Melanoma of Skin	Yes[4,5]	No
17. Osteosarcoma	Yes[4,5]	Flea Pills[11]
18. Pancreas	Yes[4,5, 7 9,10]	Flea Spray, Collars[11]
19. Leukemia	Yes[4,5]	Flea Spray, Collars[11]
20. Brain & CNS	Yes[4,5]	Flea Spray, Collars[11]
21. Rhabdomyosarcoma	Yes[4,5]	Flea Spray, Collars[11]

Yes =	16 (80%)	Yes =	13 (65%)
No =	4 (20%)	No =	3 (14%)
		N.A. =	4 (19%)

[1]Source: Sandusky County Health Department; Comprehensive Cancer Control Program, Ohio Department of Health, 2010
[2]N.A. = Not Applicable
[3]CNS = Central Nervous System
[4]Dog
[5]Cat
[6]Rabbits
[7]Hamster
[8]Turtles
[9]Birds
[10]Rats
[11]Applied by adults

Table 18

Residence in Close Proximity to Industrial Sites Prior to Diagnosis: Eastern Sandusky County Childhood Cancer Profile, 1996-2010, n=20[1]

Case	Residence in Close Proximity to Industrial Site	Estimated Distance	Odors, Dusts, Noted
1. Leukemia	No	N.A.[2]	N.A.
2. Brain & CNS[3]	No	N.A.	N.A.
3. Ewing's Sarcoma	No	N.A.	N.A.
4. Brain & CNS	Yes[4,5]	1 mile	Oil, chemicals
5. Melanoma of Skin	No	N.A.	N.A.
6. Brain & CNS	No	N.A.	N.A.
7. Rhabdomyosarcoma	Yes[4]	½ mile	Burning, irritating odors
8. Thyroid	Yes[6]	¼ mile	None
9. Hodgkin's Lymphoma	Yes[4]	1 mile	None
10. Brain & CNS	No	N.A.	N.A.
11. Brain & CNS	Yes[5]	Don't know	None
12. Rhabdomyosarcoma	Yes[4, 7]	Don't know	Horrible smell
13. Leukemia	No	N.A.	N.A.
15. Brain & CNS	No	N.A.	N.A.
16. Melanoma of Skin	Yes[8]	1 mile	Dusts
17. Osteosarcoma	No	N.A.	N.A.
18. Pancreas	Yes[7]	3 miles	None
19. Leukemia	No	N.A.	N.A.
20. Brain & CNS	Yes[7]	1 mile	None
21. Rhabdomyosarcoma	Yes[9]	50 feet	Stone cutting dusts

Yes	10 (50%)
No	10 (50%)

[1]Source: Sandusky County Health Department; Comprehensive Cancer Control Program, Ohio Department of Health, 2010
[2]N.A. = Not Applicable
[3]CNS=Central Nervous System
[4]Large Industrial Plant
[5]Old Landfill
[6]Trucking Site, junkyard
[7]Chemical Waste Disposal Site
[8]Light Manufacturing Plant
[9]Stone Cutting Site

Table 19

Residence in Close Proximity to Cell Phone Towers, and/or High Voltage Electric Power Lines and Cell Phone Usage Prior to Diagnosis: Eastern Sandusky County Childhood Cancer Profile, 1996-2010, n=20[1]

Case	Cell Phone Tower Close to Residence	High Voltage Electric Power Lines Close to Residence	Cell Phone Usage
1. Leukemia	No	No	No
2. Brain & CNS[2]	No	No	No
3. Ewing's Sarcoma	No	No	No
4. Brain & CNS	Yes[3]	No	No
5. Melanoma of Skin	No	Yes[4]	No
6. Brain & CNS	No	No	No
7. Rhabdomyosarcoma	No	No	No
8. Thyroid	No	No	No
9. Hodgkin's Lymphoma	No	No	No
10. Brain & CNS	No	No	No
11. Brain & CNS	No	No	No
12. Rhabdomyosarcoma	Don't Know	No	No
13. Leukemia	No	No	No
15. Brain & CNS	No	No	Yes[5]
16. Melanoma of Skin	Don't Know	Don't Know	No
17. Osteosarcoma	Yes[6]	No	No
18. Pancreas	Yes[7]	Yes[9]	Yes[8]
19. Leukemia	No	No	No
20. Brain & CNS	No	No	No
21. Rhabdomyosarcoma	Yes[10]	No	No
	Yes= 4 (20%)	**Yes=2 (10%)**	**Yes =2 (10%)**
	No= 14 (70%)	**No=17 (85%)**	**No =18 (90%)**
	Don't Know= 2 (10%)	**Don't Know=1 (5%0**	**Don' Know =0 (0%)**

[1]Source: Sandusky County Health Department; Comprehensive Cancer Control Program, Ohio Department of Health, 2010
[2]CNS=Central Nervous System
[3]Four Hundred Yards away
[4]One Mile away
[5]Once a day
[6]0.5 Mile away
[7]0.5 Mile away
[8]Multiple times a day
[9]1,000 feet away
[10]0.5 Mile away

Table 20

Ponds and Streams on Property of Residence Prior to Diagnosis: Eastern Sandusky County Childhood Cancer Profile, 1996-2010, n=20[1]

	POND			STREAM		
Case	**Presence**	**Activity**	**Frequency**	**Presence**	**Activity**	**Frequency**
1. Leukemia	No	N.A.[2]	N.A.	No	N.A.	N.A.
2. Brain & CNS[3]	Yes	No	N.A.	No	N.A.	N.A.
3. Ewing's Sarcoma	No	N.A.	N.A.	No	N.A.	N.A.
4. Brain & CNS	No	N.A.	N.A.	Yes	Yes[4]	Seldom
5. Melanoma of Skin	Yes	Yes[4,5]	Often	Yes	Yes[4,5]	Sometimes
6. Brain & CNS	No	N.A.	N.A.	No	N.A.	N.A.
7. Rhabdomyosarcoma	No	N.A.	N.A.	Yes	No	N.A.
8. Thyroid	No	N.A.	N.A.	No	N.A.	N.A.
9. Hodgkin's Lymphoma	No	N.A.	N.A.	No	N.A.	N.A.
10. Brain & CNS	No	N.A.	N.A.	Yes	No	N.A.
11. Brain & CNS	No	N.A.	N.A.	No	N.A.	N.A.
12. Rhabdomyosarcoma	No	N.A.	N.A.	Yes	Yes[6]	Often
13. Leukemia	Yes	Yes[4,5,7]	Seldom	Yes	Yes[4,7]	Seldom
15. Brain & CNS	No	N.A.	N.A.	No	N.A.	N.A.
16. Melanoma of Skin	No	N.A.	N.A.	No	N.A.	N.A.
17. Osteosarcoma	No	N.A.	N.A.	Yes	No	N.A.
18. Pancreas	Yes	No	N.A.	No	N.A.	N.A.
19. Leukemia	Yes	Yes[4,5,7]	Seldom	Yes	Yes[4,7]	Seldom
20. Brain & CNS	No	N.A.	N.A.	No	N.A.	N.A.
21. Rhabdomyosarcoma	No	N.A.	N.A.	No	N.A.	N.A.

Yes =5 (25%)
No =15 (75%)

Yes = 8 (40%)
No = 12 (60%)

[1]Source: Sandusky County Health Department; Comprehensive Cancer Control Program, Ohio Department of Health, 2010
[2]N.A. = Not Applicable
[3]CNS=Central Nervous System
[4]Wading
[5]Swimming
[6]Played along banks
[7]Fishing

Table 21

Drinking Water Sources During Pregnancy and Birth to Diagnosis: Eastern Sandusky County Childhood Cancer Profile, 1996-2010, n=20[1]

	DURING PREGNANCY		BIRTH TO DIAGNOSIS	
Case	**Primary**	**Secondary**	**Primary**	**Secondary**
1. Leukemia	Private well	Bottled[2]	Private well	Private well
2. Brain & CNS[3]	Public[4]	Public[4]	None[5]	None[5]
3. Ewing's Sarcoma	Public[6]	Public[6]	Private well, public[6,7]	Public[6,7]
4. Brain & CNS	Public[8]	Public[9]	Public[8]	Public[8]
5. Melanoma of Skin	Private well, public[4]	Public[4]	Private well, public[10]	Public[8]
6. Brain & CNS	Private well	Public[4]	Private well, public[4]	Public[4,7,11]
7. Rhabdomyosarcoma	Private well	Private well[12]	Private well, public[4]	Private well, public[4,9]
8. Thyroid	Private well	Public[4]	Private well, public[7]	Private well
9. Hodgkin's Lymphoma	Public[7]	Public[4]	Public[4,7]	Public[4]
10. Brain & CNS	Public[13]	Public[4]	Private well, public[4]	Public[4,7]
11. Brain & CNS	Public[14]	Public[14]	Private well, public[4]	Public[4]
12. Rhabdomyosarcoma	Public[4]	Public[4]	Public[4]	Public[4,7]
13. Leukemia	Private well	Public[4]	Private well	Public[4,9]
15. Brain & CNS	Public[4]	Public[4]	Public[4]	Public[4]
16. Melanoma of Skin	Public[15]	Public[4]	Public[15]	Public[7]
17. Osteosarcoma	Public[16]	Public[16]	Private well, public[4,15]	Public[4,7]
18. Pancreas	Public[17]	Public[13]	Public[15,17]	Public[13]
19. Leukemia	Private well	Public[4]	Private well	Public[4,9]
20. Brain & CNS	Public[13]	Public[11]	Public[13], cistern[18]	Public[13], cistern[15]
21. Rhabdomyosarcoma	Public[11]	Public[4]	Private well	Public[4,11]
Private Well	**7 (35%)**	**1 (5%)**	**12 (60%)**	**3 (15%)**
Public	**14 (70%)**	**18 (90%)**	**15 (75%)**	**17 (85%)**
Bottled	**0 (0%)**	**1 (5%)**	**0 (0%)**	**0 (0%)**
Cistern	**0 (0%)**	**0 (0%)**	**1 (5%)**	**1 (5%)**
None	**0 (0%)**	**0 (0%)**	**1 (5%)**	**1 (5%)**

Continued on page 53

[1]Source: Sandusky County Health Department; Comprehensive Cancer Control Program, Ohio Department of Health, 2010
[2]Private company
[3]CNS=Central Nervous System
[4]Clyde City
[5]Child was exclusively breast fed
[6]Toledo City
[7]Fremont City
[8]Hauled from Clyde City
[9]Green Springs City
[10]Hauled from Castalia
[11]Bellevue City
[12]Lyme School
[13]Sandusky County
[14]Detroit City
[15]Northern Ohio Rural Water
[16]Pewaukee City, WI
[17]Hauled from Sandusky City
[18]Mountain water with collection cistern in Idaho

Table 22

Presence of Old Dumps/Waste Disposal Areas on Property of Residence Prior to Diagnosis: Eastern Sandusky County Childhood Cancer Profile, 1996-2010, n=20[1]

Case	Presence: Yes/No	Potential Exposure
1. Leukemia	No	N.A.[2]
2. Brain & CNS[3]	No	N.A.
3. Ewing's Sarcoma	No	N.A.
4. Brain & CNS	No	N.A.
5. Melanoma of Skin	Yes[4]	Don't Know
6. Brain & CNS	No	N.A.
7. Rhabdomyosarcoma	No	N.A.
8. Thyroid	No	N.A.
9. Hodgkin's Lymphoma	No	N.A.
10. Brain & CNS	Yes[5]	Don't Know
11. Brain & CNS	No	N.A.
12. Rhabdomyosarcoma	Yes[6]	Don't Know
13. Leukemia	No	N.A.
15. Brain & CNS	No	N.A.
16. Melanoma of Skin	Don't Know	Don't Know
17. Osteosarcoma	Don't Know	Don't Know
18. Pancreas	No	N.A.
19. Leukemia	No	N.A.
20. Brain & CNS	No	N.A.
21. Rhabdomyosarcoma	Yes[7]	Yes; Played outside near site

Yes 4 (20%)
No 14 70%)
Don't Know 2 (10%)

[1]Source: Sandusky County Health Department; Comprehensive Cancer Control Program, Ohio Department of Health, 2010
[2]N.A. = Not Applicable
[3]CNS=Central Nervous System
[4]Buried trash, outhouse till 1950s
[5]Found buried trash, broken glass
[6]Have heard that there is old dump on property
[7]Map shows old dump on property

Table 23

Tearing Down and/or Burning of Buildings/Structures on Property of Residence Prior to Diagnosis: Eastern Sandusky County Childhood Cancer Profile, 1996-2010, n=20[1]

Case	Buildings/Structure Torn Down or Burned	Description	Disposition
1. Leukemia	No	N.A.[2]	N.A.
2. Brain & CNS[3]	Yes	Barn	Fell down, deteriorated on property
3. Ewing's Sarcoma	No	N.A.	N.A.
4. Brain & CNS	No	N.A.	N.A.
5. Melanoma of Skin	Yes	Shed, corncrib	Burned/hauled away
6. Brain & CNS	No	N.A.	N.A.
7. Rhabdomyosarcoma	No	N.A.	N.A.
8. Thyroid	No	N.A.	N.A.
9. Hodgkin's Lymphoma	No	N.A.	N.A.
10. Brain & CNS	No	N.A.	N.A.
11. Brain & CNS	Yes	Structure with unknown use	Hauled away
12. Rhabdomyosarcoma	No	N.A.	N.A.
13. Leukemia	No	N.A.	N.A.
15. Brain & CNS	No	N.A.	N.A.
16. Melanoma of Skin	Yes	Old trailer	Burned on site
17. Osteosarcoma	No	N.A.	N.A.
18. Pancreas	No	N.A.	N.A.
19. Leukemia	No	N.A.	N.A.
20. Brain & CNS	No	N.A.	N.A.
21. Rhabdomyosarcoma	No	N.A.	N.A.

Yes = 4 (20%)
No = 16 (80%)

[1]Source: Sandusky County Health Department; Comprehensive Cancer Control Program, Ohio Department of Health, 2010
[2]N.A. = Not Applicable
[3]CNS=Central Nervous System

Table 24

Painting and Remodeling in Home Prior to Diagnosis: Eastern Sandusky County Childhood Cancer Profile, 1996-2010, n=20[1]

Case	Painting/Remodeling	Description
1. Leukemia	No	N.A.[2]
2. Brain & CNS[3]	No	N.A.
3. Ewing's Sarcoma	No	N.A.
4. Brain & CNS	Yes	Periodic painting, wall papering
5. Melanoma of Skin	Yes	Built an additional room
6. Brain & CNS	Yes	Built new home
7. Rhabdomyosarcoma	No	N.A.
8. Thyroid	No	N.A.
9. Hodgkin's Lymphoma	No	N.A.
10. Brain & CNS	Yes	Built new home
11. Brain & CNS	No	N.A.
12. Rhabdomyosarcoma	No	N.A.
13. Leukemia	Yes	New garage, rooms
15. Brain & CNS	Yes	Finished attic, new walls
16. Melanoma of Skin	No	N.A.
17. Osteosarcoma	Yes	New roof
18. Pancreas	No	N.A.
19. Leukemia	No	N.A.
20. Brain & CNS	No	N.A.
21. Rhabdomyosarcoma	No	N.A.

Yes = 7 (35%)
No = 13 (65%)

[1]Source: Sandusky County Health Department; Comprehensive Cancer Control Program, Ohio Department of Health, 2010
[2]N.A. = Not Applicable
[3]CNS=Central Nervous System

Table 25

Local Fish and Game Consumption Prior to Diagnosis: Eastern Sandusky County Childhood Cancer Profile, 1996-2010, n=20[1]

Case	Locally Caught Fish	Local Game
1. Leukemia	No	No
2. Brain & CNS[2]	No	No
3. Ewing's Sarcoma	No	No
4. Brain & CNS	No	No
5. Melanoma of Skin	Yes[3]	Yes[4]
6. Brain & CNS	No	No
7. Rhabdomyosarcoma	No	No
8. Thyroid	No	No
9. Hodgkin's Lymphoma	No	No
10. Brain & CNS	Yes[3]	Yes[5]
11. Brain & CNS	No	No
12. Rhabdomyosarcoma	No	Yes[5]
13. Leukemia	No	Yes[5]
15. Brain & CNS	No	No
16. Melanoma of Skin	No	No
17. Osteosarcoma	No	No
18. Pancreas	No	No
19. Leukemia	No	Yes[5]
20. Brain & CNS	No	No
21. Rhabdomyosarcoma	No	Yes[5]
	Yes = 2 (10%) No = 18 (90%)	Yes = 6 (30%) No = 14 (70%)

[1]Source: Sandusky County Health Department; Comprehensive Cancer Control Program, Ohio Department of Health, 2010
[2]CNS=Central Nervous System
[3]Lake Erie perch at restaurants less than once a month
[4]Venison and pheasant less than once a month
[5]Venison less than once a month

Table 26

Fill Dirt Ever Brought Onto Property Prior to Diagnosis: Eastern Sandusky County Childhood Cancer Profile, 1996-2010, n=20[1]

Case	Fill Dirt Brought Onto Property	Description
1. Leukemia	No	N.A.[2]
2. Brain & CNS[3]	No	N.A.
3. Ewing's Sarcoma	No	N.A.
4. Brain & CNS	No	N.A.
5. Melanoma of Skin	Yes[4]	None
6. Brain & CNS	No	N.A.
7. Rhabdomyosarcoma	Yes[5]	When house was built
8. Thyroid	No	N.A.
9. Hodgkin's Lymphoma	No	N.A.
10. Brain & CNS	Yes[6]	All around property
11. Brain & CNS	Don't Know	N.A.
12. Rhabdomyosarcoma	No	N.A.
13. Leukemia	No	N.A.
15. Brain & CNS	Yes[7]	All around property
16. Melanoma of Skin	No	N.A.
17. Osteosarcoma	No	N.A.
18. Pancreas	No	N.A.
19. Leukemia	No	N.A.
20. Brain & CNS	No	N.A.
21. Rhabdomyosarcoma	Yes[7]	Flowerbeds, leveling of ground

Yes = 5 (25%)
No = 14 (70%)
Don't know = 1 (5%)

[1]Source: Sandusky County Health Department; Comprehensive Cancer Control Program, Ohio Department of Health, 2010
[2]N.A. = Not Applicable
[3]CNS=Central Nervous System
[4]Dirt from a private club; sand from Sandhill/Mason Road
[5]Prior to birth of case
[6]30 loads from various places in Clyde area
[7]Numerous loads of dirt and gravel from Sandusky and Seneca Counties

Table 27

Use of Wood-Burning Stoves and Fireplaces in the Home Prior to Diagnosis: Eastern Sandusky County Childhood Cancer Profile, 1996-2010, n=20[1]

Case	Outside Wood-Burning Stove	Inside Wood-Burning Stove/Fireplace	Source of Wood
1. Leukemia	No	Yes[2]	On property
2. Brain & CNS[3]	No	Yes[4]	On property
3. Ewing's Sarcoma	No	Yes[5]	No answer
4. Brain & CNS	No	Yes	No answer
5. Melanoma of Skin	No	Yes[4]	Woods near Attica
6. Brain & CNS	No	No	N.A.[6]
7. Rhabdomyosarcoma	No	No	N.A.
8. Thyroid	No	No	N.A.
9. Hodgkin's Lymphoma	No	No	N.A.
10. Brain & CNS	No	No	N.A.
11. Brain & CNS	No	No	N.A.
12. Rhabdomyosarcoma	No	No[7]	N.A.
13. Leukemia	No	No	N.A.
15. Brain & CNS	No	Yes[8]	Nearby woods
16. Melanoma of Skin	No	No	N.A.
17. Osteosarcoma	No	No	N.A.
18. Pancreas	Yes[9]	Yes[9]	On property
19. Leukemia	No	No	N.A.
20. Brain & CNS	No	No	N.A.
21. Rhabdomyosarcoma	No	Yes[10]	On property
	Yes = 1 (5%) No = 20 (95%)	Yes = 8 (40%) No = 12 (60%)	

[1]Source: Sandusky County Health Department; Comprehensive Cancer Control Program, Ohio Department of Health, 2010
[2]Fireplace on main floor used on special occasions; basement wood-burning stove used occasionally
[3]CNS=Central Nervous System
[4]Used all winter
[5]Occassional use
[6]N.A. = Not Applicable
[7]However, frequent visits to grandfather's house where a wood-burning stove was the primary source of heat
[8]Once or twice a week
[9]Daily during cold months
[10]Once a week during cold months

Table 28

Types of Fuels Used to Heat Homes Prior to Diagnosis: Eastern Sandusky County Childhood Cancer Profile, 1996-2010, n=20[1]

Case	Type of Fuel	Location of Storage Tanks
1. Leukemia	Natural gas, wood	N.A.[2]
2. Brain & CNS[3]	Propane, wood	Outside, away from house
3. Ewing's Sarcoma	Natural gas, electricity, wood	N.A.
4. Brain & CNS	Propane, wood, electricity	Outside, away from house
5. Melanoma of Skin	Propane, wood	Outside, away from house
6. Brain & CNS	Propane, natural gas	Outside, next to house
7. Rhabdomyosarcoma	Propane, natural gas	Outside, next to house
8. Thyroid	Propane, natural gas	Outside, away from house
9. Hodgkin's Lymphoma	Natural gas	N.A.
10. Brain & CNS	Natural gas, kerosene/fuel oil	Outside, next to house
11. Brain & CNS	Natural gas	N.A.
12. Rhabdomyosarcoma	Don't know	N.A.
13. Leukemia	Propane, natural gas, electricity	Outside, next to house
15. Brain & CNS	Natural gas, wood	N.A.
16. Melanoma of Skin	Propane, electricity, kerosene/fuel oil	Outside, next to house
17. Osteosarcoma	Propane, natural gas	Outside, next to house
18. Pancreas	Propane, wood	Outside, away from house
19. Leukemia	Propane, electricity	Outside, away from house
20. Brain & CNS	Propane, natural gas	Outside, away from house
21. Rhabdomyosarcoma	Natural gas, wood	N.A.

Propane gas: 12 (60%)
Natural gas: 13 (60%)
Wood: 8 (40%)
Electricity: 4 (20%)
Kerosene/fuel oil: 2 (10%)
Don't know: 1 (5%)

Outside, away from house: 7 (54%)
Outside, next to house: 6 (46%)
*Note: the denominator consists of the 13 homes using propane gas, kerosene/fuel oil.

*Note: Totals do not equal 20 or 100% because many homes had multiple fuels

[1]Source: Sandusky County Health Department; Comprehensive Cancer Control Program, Ohio Department of Health, 2010
[2]N.A. = Not Applicable
[3]CNS=Central Nervous System

Table 29

Storage of Solvents, Fuels, and Other Chemicals in Living Area or Basement of Residence Prior to Diagnosis: Eastern Sandusky County Childhood Cancer Profile, 1996-2010, n=20[1]

Case Number	Case Site/Type	Paints	Cleaning Supplies	Fuels	Solvents	Other Chemicals
1.	Leukemia	Yes[2]	No	No	No	No
2.	Brain & CNS[3]	Yes[4,5]	No	No	No	No
3.	Ewing's Sarcoma	Yes[5]	No	No	No	No
4.	Brain & CNS	Yes[5]	No	No	No	No
5.	Melanoma of Skin	No	No	No	No	No
6.	Brain & CNS	Yes[5]	No	No	No	No
7.	Rhabdomyosarcoma	No	No	No	No	No
8.	Thyroid	Yes[5]	No	No	No	No
9.	Hodgkin's Lymphoma	Yes[5]	No	No	No	No
10.	Brain & CNS	Yes[5]	No	No	No	No
11.	Brain & CNS	No	No	No	No	No
12.	Rhabdomyosarcoma	No	No	No	No	No
13.	Leukemia	Yes[5]	No	No	No	No
15.	Brain & CNS	Yes[5]	No	No	No	No
16.	Melanoma of Skin	No	No	No	No	No
17.	Osteosarcoma	Yes[5]	No	No	No	No
18.	Pancreas	Yes[5]	No	No	No	No
19.	Leukemia	Yes[5]	No	No	No	No
20.	Brain & CNS	No	No	No	No	No
21.	Rhabdomyosarcoma	No	No	No	No	No
		Yes = 13 (65%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
		No = 7 (35%)	20 (100%)	20 (100%)	20 (100%)	20 (100%)

[1]Source: Sandusky County Health Department; Comprehensive Cancer Control Program, Ohio Department of Health, 2010
[2]"Back Room" of home
[3]Central Nervous System
[4]Living area
[5]Basement

Table 30

Location of Patient Bedroom in Relation to Garage Prior to Diagnosis: Eastern Sandusky County Childhood Cancer Profile, 1996-2010, n=20[1]

Case Number	Case Site/Type	Attached or Separate Garage	Location of Case Bedroom
1.	Leukemia	Separate	N.A.[2]
2.	Brain & CNS[3]	Separate	N.A.
3.	Ewing's Sarcoma	Attached	First Floor, away from garage
4.	Brain & CNS	Separate	N.A.
5.	Melanoma of Skin	Separate	N.A.
6.	Brain & CNS	Attached	Over garage
7.	Rhabdomyosarcoma	Attached	First Floor
8.	Thyroid	Attached	Second floor, away from garage
9.	Hodgkin's Lymphoma	Separate	N.A.
10.	Brain & CNS	Attached	Second floor, away from garage
11.	Brain & CNS	Separate	N.A.
12.	Rhabdomyosarcoma	Attached	Second floor, away from garage
13.	Leukemia	Attached	First Floor
15.	Brain & CNS	Attached	Second floor, away from garage
16.	Melanoma of Skin	No Garage	N.A.
17.	Osteosarcoma	Attached	Basement
18.	Pancreas	Attached	Second floor, away from garage
19.	Leukemia	Attached	First Floor
20.	Brain & CNS	Attached	Second floor, away from garage
21.	Rhabdomyosarcoma	Separate	N.A.

Attached= 12 (60%)
Separate= 7 (35%)
No Garage= 1 (5%)

Over attached garage= 1 (8%)
Away from attached garage= 7 (58%)
First floor, not specified= 3 (25%)
Basement=1 (8%)

*Note: the denominator is the 12 homes with attached garages

[1]Source: Sandusky County Health Department; Comprehensive Cancer Control Program, Ohio Department of Health, 2010
[2]N.A. = Not Applicable
[3]CNS=Central Nervous System

Table 31

Use of Playgrounds and Parks Prior to Diagnosis: Eastern Sandusky County Childhood Cancer Profile, 1996-2010, n=20[1]

Case Number	Case Site/Type	Park/Playground	Frequency
1.	Leukemia	None	N.A.[2]
2.	Brain & CNS[3]	None	N.A.
3.	Ewing's Sarcoma	East side Park, Fremont	Often
4.	Brain & CNS	Community Park, Clyde	Often
5.	Melanoma of Skin	● South main School Park, Clyde ● Wee People, Castalia	Seldom Sometimes
6.	Brain & CNS	None	N.A.
7.	Rhabdomyosarcoma	● Community Park, Clyde ● Green Springs Park, Green Springs ● Connor Park, Fremont	Often Seldom Seldom
8.	Thyroid	None	N.A.
9.	Hodgkin's Lymphoma	None	N.A.
10.	Brain & CNS	● Community Park, Clyde ● Clyde High School Fields, Clyde ● McPherson Middle School Park, Clyde	Often Often Often
11.	Brain & CNS	Community Park, Clyde	Often
12.	Rhabdomyosarcoma	Community Park, Clyde	Often
13.	Leukemia	Community Park, Clyde	Often
15.	Brain & CNS	● South Main School Park, Clyde ● Community Park, Clyde	Often Sometimes
16.	Melanoma of Skin	Community Park, Clyde	Often
17.	Osteosarcoma	None	N.A.
18.	Pancreas	None	N.A.
19.	Leukemia	Community Park, Clyde	Often
20.	Brain & CNS	None	N.A.
21.	Rhabdomyosarcoma	None	N.A.

- East Side Park, Fremont= 1 (5%)
- Connor Park, Fremont= 1 (5%)
- Wee People, Castalia= 1 (5%)
- Green Springs Park, Green Springs= 1 (5%)
- Community Park, Clyde= 9 (45%)
- South Main School Park, Clyde= 2 (10%)
- Clyde High School fields, Clyde= 1 (5%)
- McPherson Middle School Park, Clyde= 1 (5%)
- None= 9 (45%)

[1]Source: Sandusky County Health Department; Comprehensive Cancer Control Program, Ohio Department of Health, 2010

[2]N.A. = Not Applicable

[3]CNS=Central Nervous System

EXHIBIT F

SITE ASSESSMENT REPORT
FOR THE
WHIRLPOOL PARK SITE
GREEN SPRINGS, SANDUSKY COUNTY, OHIO

NPL STATUS: NON-NPL

Prepared for:

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Emergency Response Branch
Region V
25089 Center Ridge Road
Westlake, OH 44145

Prepared by:

WESTON SOLUTIONS, INC.
6779 Engle Road
Suite I
Middleburg Heights, OH 44130

Date Prepared:	September 28, 2012
Technical Direction Document No.:	S05-0001-1111-033
Document Control No.:	1691-2A-BAGN
Contract No.:	EP-S5-06-04
START Project Manager:	TJ McFarland
Telephone No.:	(440) 202-2800
U.S. EPA On-Scene Coordinator:	Stephen Wolfe

SITE ASSESSMENT REPORT
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25089 Center Ridge Road
Westlake, OH 44145

Prepared by:

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September 28, 2012

Prepared by: Dustin Bates Date: 9/28/2012
Dustin Bates
START Project Scientist

Reviewed by: TJ McFarland Date: 9/28/2012
TJ McFarland
START Project Manager

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ABBREVIATIONS AND ACRONYMS

bgs	Below ground surface
CFR	Code of Federal Regulations
mg/kg	Milligram per kilogram
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
Ohio EPA	Ohio Environmental Protection Agency
OSC	On-scene Coordinator
PCB	Polychlorinated biphenyl
PID	Photoionization detector
ppm	Part per million
RSL	Regional Screening Level
START	Superfund Technical Assessment and Response Team
SVOC	Semivolatile organic compound
TAL	Target Analyte List
TCLP	Toxicity Characteristic Leaching Procedure
U.S. EPA	United States Environmental Protection Agency
VOC	Volatile organic compound
WESTON	Weston Solutions, Inc.

1. INTRODUCTION

The United States Environmental Protection Agency (U.S. EPA) Region 5 Emergency Response Branch tasked the Weston Solutions, Inc. (WESTON®), Superfund Technical Assessment and Response Team (START) to assist with a site assessment at the Whirlpool Park Site in Green Springs, Sandusky County, Ohio (the Site) (**Figure 1**). Specifically, under Technical Direction Document No. S05-0001-1111-033, WESTON START was tasked to perform the following activities:

- Document Site conditions
- Conduct limited geophysical survey
- Complete Geoprobe borings
- Collect subsurface soil samples

On June 13 and 15, 2012, WESTON START personnel mobilized to the Site and conducted site assessment tasks under the direction of On-Scene Coordinator (OSC) Joseph Fredle.

This site assessment report is organized into the following sections:

- **Section 1, Introduction –** Briefly describes the objectives of the site assessment and the site assessment report organization
- **Section 2, Site Background –** Details the Site description and history
- **Section 3, Site Assessment Activities –** Discusses methods used and activities conducted during the site assessment
- **Section 4, Site Assessment Results –** Discusses geophysical survey results and analytical results for samples collected during the site assessment
- **Section 5, Summary –** Summarizes the site assessment findings

2. SITE BACKGROUND

This section discusses the Site description and history.

2.1 SITE DESCRIPTION

The Site is located at the intersection of Township Road 187 and County Road 181 in Green Springs, Ohio (**Figure 1**). The Site's approximate geographical coordinates are 41.3048° North

latitude and -83.0198° West longitude. According to the Sandusky County Auditor's Tax Map, the Site's footprint encompasses approximately 27 acres. The Site is surrounded by agricultural land and private residences in a rural area approximately 5 miles southwest of downtown Clyde. The site assessment investigation area includes the area immediately surrounding the basketball court in the southeast corner of the Site (**Figure 2**).

2.2 SITE HISTORY

Originally, 14 Sites were selected for investigation in an area of Sandusky County surrounding the city of Clyde, Ohio. These Sites were identified in a previous study entitled "Childhood Cancer among Residents of Eastern Sandusky County (October 30, 2009) conducted by the Ohio EPA and the Ohio Department of Health as candidate Sites for further investigation.

Coinciding with the initial investigation of the 14 Sites identified by the Ohio EPA and the Ohio Department of Health, U.S. EPA established a telephone hotline to allow individuals in the local community the opportunity to inform U.S. EPA of additional potential dump sites in the area. U.S. EPA received approximately 90 calls to the hotline regarding potential dump sites. Sufficient information was acquired to perform a removal site assessment on this property.

3. SITE ASSESSMENT ACTIVITIES

The site assessment tasks were designed to document the potential for imminent and substantial threats to the public health or welfare of the United States or the environment based on guidance in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), Title 40 of the *Code of Federal Regulations* (CFR), Part 300.415(b)(2). In particular, the site assessment activities focused on identifying potential sources of soil and water contamination. **Appendix A** provides photographic documentation of the site assessment activities and Site conditions.

On June 13, 2012, the U.S. EPA OSC and WESTON START members mobilized to the Site to begin field work. A limited geophysical survey was performed during this visit using ground-penetrating radar, and the preliminary data were used to screen the proposed boring locations for underground utilities.

On June 15, 2012, the U.S. EPA OSC, WESTON START members, and Buckeye Probe mobilized to the Site to advance soil borings at six locations, WP-B01 through WP-B06 (**Figure 3**). The Buckeye Probe operator used a track-mounted, hydraulic, direct-push probe rig to recover continuous soil cores from each boring location at depths ranging from 8 to 16 feet below ground surface (bgs). As part of the geophysical survey, WESTON START characterized the soil on separate boring logs (**Appendix B**) and field screened each core at 2-foot intervals for volatile organic compounds (VOC) using a photoionization detector (PID).

Sampling locations and depth intervals were selected based on historical data, field conditions, and PID field screening results. Up to two soil samples were collected from each soil boring. Subsurface soil samples were collected from the acetate liners using high-density polyethylene scoops. The sampled material was placed into a re-sealable bag, homogenized, and transferred to laboratory-provided sample containers. Subsurface soil samples were stored in a cooler on ice for delivery to the designated laboratory. The samples were analyzed for total VOCs; total semivolatile organic compounds (SVOC); Target Analyte List (TAL) metals plus boron and hexavalent chromium; total pesticides and herbicides; polychlorinated biphenyls (PCB); Toxicity Characteristic Leaching Procedure (TCLP) VOCs, SVOCs, pesticides, and herbicides; and TCLP metals.

4. SITE ASSESSMENT RESULTS

The geophysical survey and subsurface soil sample analytical results are discussed below.

4.1 GEOPHYSICAL SURVEY RESULTS

Boring WP-B01, located along the south edge of the basketball court, consisted of a 0.5-foot topsoil layer underlain by a 3.5-foot dry, brown clay and silt layer. Approximately 2.5 feet of black sludge fill material lay beneath. A moist, blackish-green clay layer extended below to 8 feet bgs, underlain by a stiff, yellowish-brown clay layer extending to the termination of the boring at 12 feet bgs. PID VOC readings ranged from 5.1 to 5.7 parts per million (ppm) in the 0- to 4-foot-bgs interval and from 0 to 5.1 ppm below 4 feet bgs. A soil sample was collected from the 6- to 8-foot-bgs interval and submitted for laboratory analysis (see Section 4.2).

Boring WP-B02, located along the east edge of the basketball court, consisted of a 0.5-foot topsoil layer underlain by a 9.5-foot layer of mottled gray and black sludge fill material with a petroleum odor. Approximately 0.5 foot of moist, mottled gray and black silt and sand with a petroleum odor lay beneath. A moist, gray clay layer extended below to 12 feet bgs, underlain by a dry, mottled brown and orange clay layer extending to the termination of the boring at 16 feet bgs. PID VOC readings ranged from 16 to 28 ppm in the 0 to 10.5-foot-bgs interval and from 2.3 to 4.4 ppm below 10.5 feet bgs. Soil samples were collected from the 2 to 4 foot-bgs interval and from the 10- to 12-foot-bgs interval and submitted for laboratory analysis (see Section 4.2).

Boring WP-B03, located along the north edge of the basketball court, consisted of a 0.5-foot topsoil layer underlain by a 3.5-foot dry, brown clay and silt layer. A moist, green clay layer extended below to 7 feet bgs, underlain by a dry, brown and orange clay layer extending to the termination of the boring at 12 feet bgs. PID VOC readings ranged from 0.7 to 1.4 ppm in the 0- to 8-foot-bgs interval and were 0 ppm below 8 feet bgs. A soil sample was collected from the 4- to 6-foot-bgs interval and submitted for laboratory analysis

Boring WP-B04, located along the west edge of the basketball court, consisted of a 0.5-foot topsoil layer underlain by a 3.5-foot dry, yellowish-brown clay and silt layer. Approximately 2 feet of mottled, gray and black sludge fill material lay beneath. A moist, blackish-green clay layer extended below to 9.5 feet bgs, underlain by a stiff, brown clay layer extending to the termination of the boring at 12 feet bgs. PID VOC readings ranged from 2.1 to 7.6 ppm in the 0- to 6-foot-bgs interval. In the 6- to 8-foot-bgs interval, the PID VOC reading was 45 ppm. Below 8 feet bgs, PID readings ranged from 5.1 to 7.3 ppm VOCs. A soil sample was collected from the 6- to 8-foot-bgs interval and submitted for laboratory analysis (see Section 4.2).

Boring WP-B05, located approximately 200 feet west of the basketball court, consisted of a 1.5-foot layer of moist, orangish-brown sand underlain by a 0.5-foot orange silt layer. Below this, a moist, gray clay layer extended to the termination of the boring at 8 feet bgs. PID VOC readings ranged from 2.9 to 4.3 ppm. A soil sample was collected from the 0- to 2-foot-bgs interval and submitted for laboratory analysis (see Section 4.2).

Boring WP-B06, located approximately 220 feet southwest of the basketball court, consisted of a 1.5-foot layer of moist, orangish-brown sand underlain by a 0.5-foot orange silt layer. Below this, a moist, gray clay layer extended to the termination of the boring at 8 feet bgs. PID VOC readings ranged from 0 to 2.9 ppm. A soil sample was collected from the 0- to 2-foot-bgs interval and submitted for laboratory analysis (see Section 4.2).

4.2 SUBSURFACE SOIL SAMPLE ANALYTICAL RESULTS

Six subsurface soil samples were collected from the Site for laboratory analysis. The ALS Environmental laboratory of Holland, Michigan, analyzed the samples for total VOCs; total SVOCs; TAL metals plus boron and hexavalent chromium; total pesticides and herbicides; PCBs; TCLP VOCs, SVOCs, pesticides, and herbicides; and TCLP metals.

The analytical results were compared to the (1) U.S. EPA Regional Screening Levels (RSL) for residential properties; (2) U.S. Geological Survey average concentration of arsenic in Sandusky County, Ohio; (3) U.S. EPA requirements for PCB spill cleanup (40 CFR 761.125); or (4) U.S. EPA Maximum Concentration of Contaminants for the Toxicity Characteristic (40 CFR 261.24). Each sample result that exceeded the applicable screening criterion is listed below, followed by the screening criterion listed in parentheses. **Figure 4** lists the analytical results exceeding the screening criteria. **Table 1** summarizes the full analytical results for each sample and provides the complete list of analytes. **Appendix C** provides the analytical data validation report.

WP-B01-S01-061512

PCBs: Aroclor 1254 = 1.2 milligrams per kilogram (mg/kg) (0.22 mg/kg)

WP-B02-S01-061512 (6 to 8 feet bgs)

PCBs: Aroclor 1254 = 0.25 mg/kg (0.22 mg/kg)

WP-B02-S02-061512 (10 to 12 feet bgs)

TAL Metals:	Cobalt = 26 mg/kg (23 mg/kg)
PCBs:	Aroclor 1254 = 170 mg/kg (0.22 mg/kg and 50 mg/kg)

WP-B03-S01-061512

PCBs:	Aroclor 1254 = 1.8 mg/kg (0.22 mg/kg)

WP-B04-S01-061512

TAL Metals:	Cobalt = 560 mg/kg (23 mg/kg) Nickel = 1,600 mg/kg (1,500 mg/kg)
PCBs:	Aroclor 1254 = 1,200 mg/kg (0.22 mg/kg and 50 mg/kg)

WP-B05-S01-061512

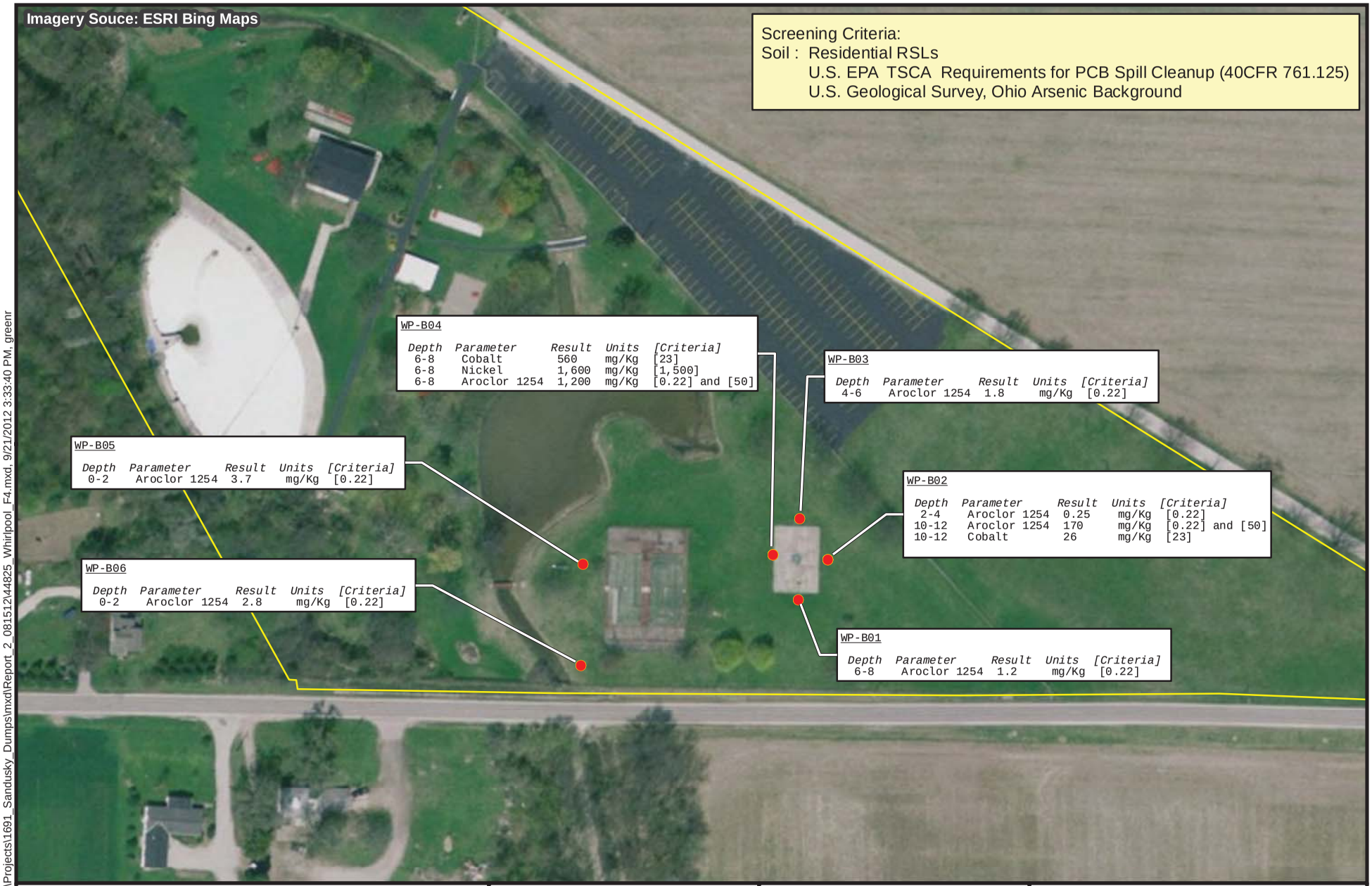
PCBs:	Aroclor 1254 = 3.7 mg/kg (0.22 mg/kg)

WP-B06-S01-061512

PCBs:	Aroclor 1254 = 2.8 mg/kg (0.22 mg/kg)

5. SUMMARY

The tip line complaint included information that the Whirlpool Corporation filled in the area immediately surrounding and under the basketball court in the southeast corner of the Site. The fill material was described as black sludge-like material. Four soil borings (B01-B04) were completed around the basketball court, one on each side of the court. Two soil borings (B05 and B06) were completed near a former playground located southwest of the basketball court, in an area believed to be outside of the fill area. Analytical results for all subsurface soil samples indicated that PCBs were present in the subsurface soil at levels exceeding the U.S. EPA RSLs for residential properties. Analytical results for subsurface soil samples collected from soil borings B02 and B04 indicated that total metals were present in the subsurface soil at levels exceeding the U.S. EPA RSLs for residential properties and PCBs were present at levels exceeding the U.S. EPA requirements for PCB spill cleanup.



Legend

- Soil Boring Sampling Locations with Exceedances
- Site Boundary

Soil Boring Depth Units = Feet bgs

N

0 150 Feet

Prepared For:
U.S. EPA REGION V
Contract No.: EP-S5-06-04
TDD: S05-0001-1111-033
DCN: 1691-2A-BAGN

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Figure 4
Soil Analytical Results
Exceeding Screening Criteria
Whirlpool Park Site
Green Springs, Sandusky County, Ohio

Path: C:\Users\greenr\GIS\Projects\1691_Sandusky_Dumps\mxd\Report_2_08151244825_Whirlpool_F4.mxd, 9/21/2012 3:33:40 PM, greenr

TABLE 1
SUBSURFACE SOIL ANALYTICAL RESULTS
WHIRLPOOL PARK SITE
GREEN SPRINGS, SANDUSKY, OHIO

Analytical Method	Analytical Parameter	Unit	Screening Criterion	Location ID	WP-B01	WP-B02	WP-B02	WP-B03	WP-B04	WP-B05	WP-B06
				Field Sample ID	WP-B01-S01-061512	WP-B02-S01-061512	WP-B02-S02-061512	WP-B03-S01-061512	WP-B04-S01-061512	WP-B05-S01-061512	WP-B06-S01-061512
				Sampling Date	6/15/2012	6/15/2012	6/15/2012	6/15/2012	6/15/2012	6/15/2012	6/15/2012
				Sampling Depth (feet bgs)	6-8	2-4	10-12	4-6	6-8	0-2	0-2
							Result				
				VOCs[1]							
SW8260	1,1,2,2-Tetrachloroethane	mg/kg	0.56		0.037 U	0.055 U	0.048 U	0.057 U	0.14 U	0.035 U	0.037 U
SW8260	1,1,2-Trichloroethane	mg/kg	1.1		0.037 U	0.055 U	0.048 U	0.057 U	0.14 U	0.035 U	0.037 U
SW8260	1,1,2-Trichlorotrifluoroethane	mg/kg	43000		0.037 U	0.055 U	0.048 U	0.057 U	0.14 U	0.035 U	0.037 U
SW8260	1,1,1-Trichloroethane	mg/kg	8700		0.037 U	0.055 U	0.048 U	0.057 U	0.14 U	0.035 U	0.037 U
SW8260	1,1-Dichloroethane	mg/kg	3.3		0.037 U	0.055 U	0.048 U	0.057 U	0.14 U	0.035 U	0.037 U
SW8260	1,1-Dichloroethene	mg/kg	240		0.037 U	0.055 U	0.048 U	0.057 U	0.14 U	0.035 U	0.037 U
SW8260	1,2,4-Trichlorobenzene	mg/kg	22		0.037 U	0.055 U	0.048 U	0.057 U	0.14 U	0.035 U	0.037 U
SW8260	1,2-Dibromo-3-chloropropane	mg/kg	0.0054		0.037 U	0.055 U	0.048 U	0.057 U	0.14 U	0.035 U	0.037 U
SW8260	1,2-Dibromoethane	mg/kg	0.034		0.037 U	0.055 U	0.048 U	0.057 U	0.14 U	0.035 U	0.037 U
SW8260	1,2-Dichlorobenzene	mg/kg	1900		0.037 U	0.055 U	0.048 U	0.057 U	0.14 U	0.035 U	0.037 U
SW8260	1,2-Dichloroethane	mg/kg	0.43		0.037 U	0.055 U	0.048 U	0.057 U	0.14 U	0.035 U	0.037 U
SW8260	1,2-Dichloropropane	mg/kg	0.94		0.037 U	0.055 U	0.048 U	0.057 U	0.14 U	0.035 U	0.037 U
SW8260	1,3-Dichlorobenzene	mg/kg	NA		0.037 U	0.055 U	0.048 U	0.057 U	0.14 U	0.035 U	0.037 U
SW8260	1,4-Dichlorobenzene	mg/kg	2.4		0.037 U	0.055 U	0.048 U	0.057 U	0.14 U	0.035 U	0.037 U
SW8260	2-Butanone	mg/kg	28000		0.25 U	0.36 U	0.32 U	0.38 U	0.90 U	0.23 U	0.25 U
SW8260	2-Hexanone	mg/kg	210		0.037 U	0.055 U	0.048 U	0.057 U	0.14 U	0.035 U	0.037 U
SW8260	4-Methyl-2-pentanone	mg/kg	5300		0.037 U	0.055 U	0.048 U	0.057 U	0.14 U	0.035 U	0.037 U
SW8260	Acetone	mg/kg	61000		0.12 U	0.18 U	0.16 U	0.19 U	0.45 U	0.12 U	0.12 U
SW8260	Benzene	mg/kg	1.1		0.037 U	0.055 U	0.048 U	0.057 U	0.14 U	0.035 U	0.037 U
SW8260	Bromodichloromethane	mg/kg	0.27		0.037 U	0.055 U	0.048 U	0.057 U	0.14 U	0.035 U	0.037 U
SW8260	Bromoform	mg/kg	62		0.037 U	0.055 U	0.048 U	0.057 U	0.14 U	0.035 U	0.037 U
SW8260	Bromomethane	mg/kg	7.3		0.093 U	0.14 U	0.12 U	0.14 U	0.34 U	0.086 U	0.093 U
SW8260	Carbon disulfide	mg/kg	820		0.037 U	0.055 U	0.048 U	0.057 U	0.14 U	0.035 U	0.037 U
SW8260	Carbon tetrachloride	mg/kg	0.61		0.037 U	0.055 U	0.048 U	0.057 U	0.14 U	0.035 U	0.037 U
SW8260	Chlorobenzene	mg/kg	290		0.037 U	0.055 U	0.048 U	0.057 U	0.14 U	0.035 U	0.037 U
SW8260	Chloroethane	mg/kg	15000		0.12 U	0.18 U	0.16 U	0.19 U	0.45 U	0.12 U	0.12 U
SW8260	Chloroform	mg/kg	0.29		0.037 U	0.055 U	0.048 U	0.057 U	0.14 U	0.035 U	0.037 U
SW8260	Chloromethane	mg/kg	120		0.12 U	0.18 U	0.16 U	0.19 U	0.45 U	0.12 U	0.12 U
SW8260	cis-1,2-Dichloroethene	mg/kg	160		0.037 U	0.055 U	0.048 U	0.057 U	0.14 U	0.035 U	0.037 U
SW8260	cis-1,3-Dichloropropene	mg/kg	NA		0.037 U	0.055 U	0.048 U	0.057 U	0.14 U	0.035 U	0.037 U
SW8260	Cyclohexane	mg/kg	7000		0.037 U	0.055 U	0.048 U	0.057 U	0.14 U	0.035 U	0.037 U
SW8260	Dibromochloromethane	mg/kg	0.68		0.037 U	0.055 U	0.048 U	0.057 U	0.14 U	0.035 U	0.037 U
SW8260	Dichlorodifluoromethane	mg/kg	94		0.037 U	0.055 U	0.048 U	0.057 U	0.14 U	0.035 U	0.037 U
SW8260	Ethylbenzene	mg/kg	5.4		0.037 U	0.055 U	0.048 U	0.057 U	**0.62**	0.035 U	0.037 U
SW8260	Isopropylbenzene	mg/kg	2100		0.037 U	0.055 U	0.048 U	0.057 U	**0.38**	0.035 U	0.037 U
SW8260	Methyl acetate	mg/kg	78000		0.25 U	0.36 U	0.32 U	0.38 U	0.90 U	0.23 U	0.25 U
SW8260	Methyl tert-butyl ether	mg/kg	43		0.037 U	0.055 U	0.048 U	0.057 U	0.14 U	0.035 U	0.037 U
SW8260	Methylcyclohexane	mg/kg	NA		0.037 U	0.055	0.048 U	0.057 U	**0.37**	0.035 U	0.037 U
SW8260	Methylene chloride	mg/kg	11		0.037 U	0.055 U	0.048 U	0.057 U	0.14 U	0.035 U	0.037 U
SW8260	Styrene	mg/kg	6300		0.037 U	0.055 U	0.048 U	0.057 U	0.14 U	0.035 U	0.037 U
SW8260	Tetrachloroethene	mg/kg	0.55		0.037 U	0.055 U	0.048 U	0.057 U	0.14 U	0.035 U	0.037 U
SW8260	Toluene	mg/kg	5000		0.037 U	0.055 U	0.048 U	0.057 U	**1.7**	**0.076**	0.037 U
SW8260	trans-1,2-Dichloroethene	mg/kg	150		0.037 U	0.055 U	0.048 U	0.057 U	0.14 U	0.035 U	0.037 U
SW8260	trans-1,3-Dichloropropene	mg/kg	NA		0.037 U	0.055 U	0.048 U	0.057 U	0.14 U	0.035 U	0.037 U
SW8260	Trichloroethene	mg/kg	0.91		0.037 U	0.055 U	0.048 U	0.057 U	0.14 U	0.035 U	0.037 U
SW8260	Trichlorofluoromethane	mg/kg	790		0.037 U	0.055 U	0.048 U	0.057 U	0.14 U	0.035 U	0.037 U
SW8260	Vinyl chloride	mg/kg	0.06		0.037 U	0.055 U	0.048 U	0.057 U	0.14 U	0.035 U	0.037 U
SW8260	Xylenes, Total	mg/kg	630		0.11 U	0.16 U	0.14 U	0.17 U	**4.0**	0.10 U	0.11 U
				SVOCs[1]							
SW8270	1,1-Biphenyl	mg/kg	51		0.40 U	0.37 U	5.1 U	0.40 U	7.5 U	0.38 U	0.40 U
SW8270	2,4,5-Trichlorophenol	mg/kg	6100		0.19 U	0.18 U	2.5 U	0.19 U	3.6 U	0.18 U	0.19 U
SW8270	2,4,6-Trichlorophenol	mg/kg	44		0.19 U	0.18 U	2.5 U	0.19 U	3.6 U	0.18 U	0.19 U
SW8270	2,4-Dichlorophenol	mg/kg	180		0.19 U	0.18 U	2.5 U	0.19 U	3.6 U	0.18 U	0.19 U
SW8270	2,4-Dimethylphenol	mg/kg	1200		0.40 UJ	0.37 UJ	5.1 UJ	0.40 UJ	7.5 UJ	0.38 UJ	0.40 UJ
SW8270	2,4-Dinitrophenol	mg/kg	120		0.80 U	0.74 U	10 U	0.80 U	15 U	0.75 U	0.79 U
SW8270	2,4-Dinitrotoluene	mg/kg	1.6		0.19 U	0.18 U	2.5 U	0.19 U	3.6 U	0.18 U	0.19 U
SW8270	2,6-Dinitrotoluene	mg/kg	61		0.19 U	0.18 U	2.5 U	0.19 U	3.6 U	0.18 U	0.19 U
SW8270	2-Chloronaphthalene	mg/kg	6300		0.097 U	0.090 U	1.2 U	0.097 U	1.8 U	0.092 U	0.096 U
SW8270	2-Chlorophenol	mg/kg	390		0.19 U	0.18 U	2.5 U	0.19 U	3.6 U	0.18 U	0.19 U
SW8270	2-Methylnaphthalene	mg/kg	310		0.097 U	0.090 U	1.2 U	0.097 U	**11**	0.092 U	0.096 U
SW8270	2-Nitroaniline	mg/kg	610		0.80 U	0.74 U	10 U	0.80 U	15 U	0.75 U	0.79 U
SW8270	2-Nitrophenol	mg/kg	NA		0.19 U	0.18 U	2.5 U	0.19 U	3.6 U	0.18 U	0.19 U
SW8270	3,3-Dichlorobenzidine	mg/kg	1.1		0.80 U	0.74 U	10 U	0.80 U	15 U	0.75 U	0.79 U
SW8270	3-Nitroaniline	mg/kg	NA		0.80 U	0.74 U	10 U	0.80 U	15 U	0.75 U	0.79 U
SW8270	4,6-Dinitro-2-methylphenol	mg/kg	4.9		0.40 U	0.37 U	5.1 U	0.40 U	7.5 U	0.38 U	0.40 U
SW8270	4-Bromophenyl phenyl ether	mg/kg	NA		0.19 U	0.18 U	2.5 U	0.19 U	3.6 U	0.18 U	0.19 U
SW8270	4-Chloro-3-methylphenol	mg/kg	6100		0.19 U	0.18 U	2.5 U	0.19 U	3.6 U	0.18 U	0.19 U
SW8270	4-Chloroaniline	mg/kg	2.4		0.90 U	0.74 U	10 U	0.80 U	15 U	0.75 U	0.79 U
SW8270	4-Chlorophenyl phenyl ether	mg/kg	NA		0.19 U	0.18 U	2.5 U	0.19 U	3.6 U	0.18 U	0.19 U
SW8270	4-Nitroaniline	mg/kg	24		0.80 U	0.74 U	10 U	0.80 U	15 U	0.75 U	0.79 U
SW8270	4-Nitrophenol	mg/kg	NA		0.80 U	0.74 U	10 U	0.80 U	15 U	0.75 U	0.79 U
SW8270	Acenaphthene	mg/kg	3400		0.036 U	0.034 U	0.47 U	0.036 U	0.68 U	0.034 U	0.036 U
SW8270	Acenaphthylene	mg/kg	NA		0.036 U	0.034 U	0.47 U	0.036 U	0.68 U	0.034 U	0.036 U
SW8270	Acetophenone	mg/kg	7800		0.40 U	0.37 U	5.1 U	0.40 U	7.5 U	0.38 U	0.40 U
SW8270	Anthracene	mg/kg	17000		0.036 U	0.034 U	0.47 U	0.036 U	0.68 U	0.034 U	0.036 U
SW8270	Atrazine	mg/kg	2.1		0.40 U	0.37 U	5.1 U	0.40 U	7.5 U	0.38 U	0.40 U
SW8270	Benzaldehyde	mg/kg	7800		0.40 U	0.37 U	5.1 U	0.40 U	7.5 U	0.38 U	0.40 U
SW8270	Benzo(a)anthracene	mg/kg	0.15		0.036 U	0.034 U	0.47 U	0.036 U	0.68 U	0.034 U	0.036 U
SW8270	Benzo(a)pyrene	mg/kg	0.015		0.036 U	0.034 U	0.47 U	0.036 U	0.68 U	0.034 U	0.036 U
SW8270	Benzo(b)fluoranthene	mg/kg	0.15		0.036 U	0.034 U	0.47 U	0.036 U	0.68 U	0.034 U	0.036 U
SW8270	Benzo(g,h,i)perylene	mg/kg	NA		0.036 U	0.034 U	0.47 U	0.036 U	0.68 U	0.034 U	0.036 U

TABLE 1
SUBSURFACE SOIL ANALYTICAL RESULTS
WHIRLPOOL PARK SITE
GREEN SPRINGS, SANDUSKY, OHIO

Analytical Method	Analytical Parameter	Unit	Location ID	WP-B01	WP-B02	WP-B02	WP-B03	WP-B04	WP-B05	WP-B06
			Field Sample ID	WP-B01-S01-061512	WP-B02-S01-061512	WP-B02-S02-061512	WP-B03-S01-061512	WP-B04-S01-061512	WP-B05-S01-061512	WP-B06-S01-061512
			Sampling Date	6/15/2012	6/15/2012	6/15/2012	6/15/2012	6/15/2012	6/15/2012	6/15/2012
			Sampling Depth (feet bgs)	6-8	2-4	10-12	4-6	6-8	0-2	0-2
			Screening Criterion	Result						
SW8270	Benzo(k)fluoranthene	mg/kg	1.5	0.036 U	0.034 U	0.47 U	0.036 U	0.68 U	0.034 U	0.036 U
SW8270	Bis(2-chloroethoxy)methane	mg/kg	180	0.19 U	0.18 U	2.5 U	0.19 U	3.6 U	0.18 U	0.19 U
SW8270	Bis(2-chloroethyl)ether	mg/kg	0.21	0.19 U	0.18 U	2.5 U	0.19 U	3.6 U	0.18 U	0.19 U
SW8270	Bis(2-chloroisopropyl)ether	mg/kg	4.6	0.19 U	0.18 U	2.5 U	0.19 U	3.6 U	0.18 U	0.19 U
SW8270	Bis(2-ethylhexyl)phthalate	mg/kg	35	0.40 U	0.37 U	5.1 U	0.40 U	7.5 U	0.38 U	0.40 U
SW8270	Butyl benzyl phthalate	mg/kg	260	0.19 U	0.18 U	2.5 U	0.19 U	3.6 U	0.18 U	0.19 U
SW8270	Caprolactam	mg/kg	31000	0.40 U	0.37 U	5.1 U	0.40 U	7.5 U	0.38 U	0.40 U
SW8270	Carbazole	mg/kg	NA	0.19 U	0.18 U	2.5 U	0.19 U	3.6 U	0.18 U	0.19 U
SW8270	Chrysene	mg/kg	15	0.036 U	0.034 U	0.47 U	0.036 U	**0.93**	0.034 U	0.036 U
SW8270	Dibenzo(a,h)anthracene	mg/kg	0.015	0.036 U	0.034 U	0.47 U	0.036 U	0.68 U	0.034 U	0.036 U
SW8270	Dibenzofuran	mg/kg	78	0.19 U	0.18 U	2.5 U	0.19 U	3.6 U	0.18 U	0.19 U
SW8270	Diethyl phthalate	mg/kg	49000	0.40 U	0.37 U	5.1 U	0.40 U	7.5 U	0.38 U	0.40 U
SW8270	Dimethyl phthalate	mg/kg	NA	0.40 U	0.37 U	5.1 U	0.40 U	7.5 U	0.38 U	0.19 U
SW8270	Di-n-butyl phthalate	mg/kg	6100	0.40 U	0.37 U	5.1 U	0.40 U	7.5 U	0.38 U	0.40 U
SW8270	Di-n-octyl phthalate	mg/kg	NA	0.19 U	0.18 U	2.5 U	0.19 U	3.6 U	0.18 U	0.40 U
SW8270	Fluoranthene	mg/kg	2300	0.036 U	0.034 U	0.47 U	0.036 U	0.68 U	0.034 U	0.036 U
SW8270	Fluorene	mg/kg	2300	0.036 U	0.034 U	0.47 U	0.036 U	0.68 U	0.034 U	0.036 U
SW8270	Hexachloro-1,3-butadiene	mg/kg	6.2	0.19 U	0.18 U	2.5 U	0.19 U	3.6 U	0.18 U	0.19 U
SW8270	Hexachlorobenzene	mg/kg	NA	0.19 U	0.18 U	2.5 U	0.19 U	3.6 U	0.18 U	0.19 U
SW8270	Hexachlorocyclopentadiene	mg/kg	370	0.40 U	0.37 U	5.1 U	0.40 U	7.5 U	0.38 U	0.40 U
SW8270	Hexachloroethane	mg/kg	12	0.19 U	0.18 U	2.5 U	0.19 U	3.6 U	0.18 U	0.19 U
SW8270	Indeno(1,2,3-cd)pyrene	mg/kg	0.15	0.036 U	0.034 U	0.47 U	0.036 U	0.68 U	0.034 U	0.036 U
SW8270	Isophorone	mg/kg	510	0.19 U	0.18 U	2.5 U	0.19 U	3.6 U	0.18 U	0.19 U
SW8270	Naphthalene	mg/kg	3.6	0.036 U	0.034 U	0.47 U	0.0036 U	**2.9**	0.034 U	0.036 U
SW8270	Nitrobenzene	mg/kg	4.8	0.19 U	0.18 U	2.5 U	0.19 U	3.6 U	0.18 U	0.19 U
SW8270	N-Nitrosodi-n-propylamine	mg/kg	0.069	0.19 U	0.18 U	2.5 U	0.19 U	3.6 U	0.18 U	0.19 U
SW8270	N-Nitrosodiphenylamine	mg/kg	99	0.19 U	0.18 U	2.5 U	0.19 U	3.6 U	0.18 U	0.19 U
SW8270	o-Cresol	mg/kg	3100	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
SW8270	p-Cresol	mg/kg	310	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
SW8270	Pentachlorophenol	mg/kg	0.89	0.40 U	0.37 U	5.1 U	0.40 U	7.5 U	0.38 U	0.40 U
SW8270	Phenanthrene	mg/kg	NA	0.036 U	0.034 U	0.47 U	0.036 U	**2.4**	0.034 U	0.036 U
SW8270	Phenol	mg/kg	18000	0.19 U	0.18 U	2.5 U	0.19 U	3.6 U	0.18 U	0.19 U
SW8270	Pyrene	mg/kg	1700	0.036 U	0.034 U	0.47 U	0.036 U	0.68 U	0.034 U	0.036 U
				TAL Metals [1]						
SW6020A	Aluminum	mg/kg	77000	**14000**	**10000**	**10000**	**12000**	**18000**	**5300**	**10000**
SW6020A	Antimony	mg/kg	31	0.90 U	0.91 U	1.1 U	0.86 U	**18**	0.84 U	0.95 U
SW6020A	Arsenic	mg/kg	13.197 [2]	**9.7**	**8.2**	**5.4**	**8.9**	**13**	**6.9**	**7.2**
SW6020A	Barium	mg/kg	15000	**88**	**56**	**230**	**87**	**4000**	**45**	**55**
SW6020A	Beryllium	mg/kg	160	**0.55**	**0.43**	0.45 U	**0.48**	**0.77**	0.34 U	**0.41**
SW6020A	Boron	mg/kg	16000	**68**	**8.1**	**650**	**32**	**5700**	**37**	**13**
SW6020A	Cadmium	mg/kg	70	0.36 U	0.37 U	0.45 U	**0.34**	**2.7**	0.34 U	0.38 U
SW6020A	Calcium	mg/kg	NA	**14000**	**26000**	**42000**	**14000**	**20000**	**20000**	**41000**
SW6020A	Chromium	mg/kg	NA	**20**	**14**	**84**	**20**	**390**	**8.8**	**15**
SW6020A	Cobalt	mg/kg	23	**14**	**9.3**	**26**	**17**	**560**	**9.2**	**9.5**
SW6020A	Copper	mg/kg	3100	**19**	**17**	**21**	**18**	**95**	**14**	**29**
SW7196A	Chromium, Hexavalent	mg/kg	0.29	0.61 U	0.57 U	0.79 U	0.60 U	**1.2**	0.57 U	0.59 U
SW6020A	Iron	mg/kg	55000	**23000**	**21000**	**18000**	**25000**	**43000**	**14000**	**21000**
SW6020A	Lead	mg/kg	400	**14**	**11**	**22**	**15**	**210**	**8.3**	**13**
SW6020A	Magnesium	mg/kg	NA	**5200**	**5400**	**3900**	**4300**	**8600**	**4800**	**11000**
SW6020A	Manganese	mg/kg	1800	**350**	**310**	**370**	**400**	**1100**	**360**	**390**
SW7471	Mercury	mg/kg	10	**0.035**	**0.022**	**0.11**	**0.037**	**0.13**	**0.021**	**0.022**
SW6020A	Nickel	mg/kg	1500	**36**	**23**	**150**	**57**	**1600**	**23**	**24**
SW6020A	Potassium	mg/kg	NA	**1900**	**1400**	**1400**	**1400**	**6700**	**720**	**1700**
SW6020A	Selenium	mg/kg	390	**1.2**	**0.93**	1.1 U	**0.93**	1.7 U	0.84 U	**1.1**
SW6020A	Silver	mg/kg	390	0.90 U	0.91 U	1.1 U	0.86 U	**1.8**	0.84 U	0.95 U
SW6020A	Sodium	mg/kg	NA	**200**	**69**	**1700**	**97**	**10000**	**120**	**100**
SW6020A	Thallium	mg/kg	0.78	0.90 U	0.91 U	1.1 U	0.86 U	1.7 U	0.84 U	0.95 U
SW6020A	Vanadium	mg/kg	NA	**23**	**19**	**21**	**24**	**12**	**21**	**21**
SW6020A	Zinc	mg/kg	23000	**71**	**48**	**300**	**94**	**3300**	**55**	**55**
				Pesticides and Herbicides [1]						
SW8151	2,4,5-T	mg/kg	610	0.0061 U	0.0058 U	0.0076 U	0.0060 U	0.011 U	0.0055 U	0.0058 U
SW8151	2,4,5-TP (Silvex)	mg/kg	490	0.012 U	0.012 U	0.015 U	0.012 U	0.023 U	0.011 U	0.012 U
SW8151	2,4-D	mg/kg	690	0.0061 U	0.0058 U	0.0076 U	0.0060 U	0.011 U	0.0055 U	0.0058 U
SW8081	4,4-DDD	mg/kg	2	0.012 U	**0.016**	0.077 U	0.012 U	0.12 U	0.011 U	0.012 U
SW8081	4,4-DDE	mg/kg	1.4	0.012 U	**0.068**	0.077 U	0.012 U	0.12 U	0.011 U	0.012 U
SW8081	4,4-DDT	mg/kg	1.7	0.012 U	**0.042**	0.077 U	0.012 U	0.12 U	0.011 U	0.012 U
SW8081	Aldrin	mg/kg	0.029	0.012 U	0.011 U	0.077 U	0.012 U	0.12 U	0.011 U	0.012 U
SW8081	alpha-BHC	mg/kg	0.077	0.012 U	0.011 U	0.077 U	0.012 U	0.12 U	0.011 U	0.012 U
SW8081	alpha-Chlordane	mg/kg	NA	0.012 U	0.011 U	0.077 U	0.012 U	0.12 U	0.011 U	0.012 U
SW8081	beta-BHC	mg/kg	0.27	0.012 U	0.011 U	0.077 U	0.012 U	0.12 U	0.011 U	0.012 U
SW8081	Chlordane, Technical	mg/kg	NA	0.030 U	0.028 U	0.19 U	0.029 U	0.29 U	0.028 U	0.030 U
SW8081	delta-BHC	mg/kg	NA	0.012 U	0.011 U	0.077 U	0.012 U	0.12 U	0.011 U	0.012 U
SW8081	Dieldrin	mg/kg	0.03	0.012 U	0.011 U	0.077 U	0.012 U	0.12 U	0.011 U	0.012 U
SW8081	Endosulfan I	mg/kg	NA	0.012 U	0.011 U	0.077 U	0.012 U	0.12 U	0.011 U	0.012 U
SW8081	Endosulfan II	mg/kg	NA	0.012 U	0.011 U	0.077 U	0.012 U	0.12 U	0.011 U	0.012 U
SW8081	Endosulfan sulfate	mg/kg	NA	0.012 U	0.011 U	0.077 U	0.012 U	0.12 U	0.011 U	0.012 U
SW8081	Endrin	mg/kg	18	0.012 U	0.011 U	0.077 U	0.012 U	0.12 U	0.011 U	0.012 U
SW8081	Endrin aldehyde	mg/kg	NA	0.012 U	0.011 U	0.077 U	0.012 U	0.12 U	0.011 U	0.012 U
SW8081	Endrin ketone	mg/kg	NA	0.012 U	0.011 U	0.077 U	0.012 U	0.12 U	0.011 U	0.012 U
SW8081	gamma-BHC (Lindane)	mg/kg	0.52	0.012 U	0.011 U	0.077 U	0.012 U	0.12 U	0.011 U	0.012 U
SW8081	gamma-Chlordane	mg/kg	NA	0.012 U	0.011 U	0.077 U	0.012 U	0.12 U	0.011 U	0.012 U
SW8081	Heptachlor	mg/kg	0.11	0.012 U	0.011 U	0.077 U	0.012 U	0.12 U	0.011 U	0.012 U
SW8081	Heptachlor epoxide	mg/kg	0.053	0.012 U	0.011 U	0.077 U	0.012 U	0.12 U	0.011 U	0.012 U
SW8081	Methoxychlor	mg/kg	310	0.012 U	0.011 U	0.077 U	0.012 U	0.12 U	0.011 U	0.012 U
SW8081	Toxaphene	mg/kg	0.44	0.072 U	0.067 U	0.46 U	0.069 U	0.70 U	0.067 U	0.07 U
				PCBs [1 and 3]						
SW8082	Aroclor 1016	mg/kg	3.9	0.048 U	0.045 U	0.061 U	0.046 U	0.093 U	0.044 U	0.048 U
SW8082	Aroclor 1221	mg/kg	0.14	0.048 U	0.045 U	0.061 U	0.046 U	0.093 U	0.044 U	0.048 U
SW8082	Aroclor 1232	mg/kg	0.14	0.048 U	0.045 U	0.061 U	0.046 U	0.093 U	0.044 U	0.048 U
SW8082	Aroclor 1242	mg/kg	0.22	0.048 U	0.045 U	0.061 U	0.046 U	0.093 U	0.044 U	0.048 U
SW8082	Aroclor 1248	mg/kg	0.22	0.048 U	0.045 U	0.061 U	0.046 U	0.093 U	0.044 U	0.048 U
SW8082	Aroclor 1254	mg/kg	0.22[1] and 50[3]	**1.2**[1]	**0.25**[1]	**170**[1 and 3]	**1.8**[1]	**1200**[1 and 3]	**3.7**[1]	**2.8**[1]

TABLE 1
SUBSURFACE SOIL ANALYTICAL RESULTS
WHIRLPOOL PARK SITE
GREEN SPRINGS, SANDUSKY, OHIO

Analytical Method	Analytical Parameter	Unit	Screening Criterion	Location ID	WP-B01	WP-B02	WP-B02	WP-B03	WP-B04	WP-B05	WP-B06
				Field Sample ID	WP-B01-S01-061512	WP-B02-S01-061512	WP-B02-S02-061512	WP-B03-S01-061512	WP-B04-S01-061512	WP-B05-S01-061512	WP-B06-S01-061512
				Sampling Date	6/15/2012	6/15/2012	6/15/2012	6/15/2012	6/15/2012	6/15/2012	6/15/2012
				Sampling Depth (feet bgs)	6-8	2-4	10-12	4-6	6-8	0-2	0-2
								Result			
SW8082	Aroclor 1260	mg/kg	0.22		0.048 U	0.045 U	0.061 U	0.046 U	0.093 U	0.044 U	0.048 U
				TCLP VOCs, SVOCs, Pesticides, and Herbicides [4]							
SW8260	1,1-Dichloroethene, TCLP	mg/L	0.7		0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
SW8260	1,2-Dichloroethane, TCLP	mg/L	0.5		0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
SW8270	1,4-Dichlorobenzene, TCLP	mg/L	7.5		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
SW8270	2,4,6-Trichlorophenol, TCLP	mg/L	2		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
SW8270	2,4,5-Trichlorophenol, TCLP	mg/L	400		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
SW8151	2,4,5-TP (Silvex), TCLP	mg/L	1		0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SW8151	2,4-D, TCLP	mg/L	10		0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SW8270	2,4-Dinitrotoluene, TCLP	mg/L	0.13		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
SW8260	2-Butanone, TCLP	mg/L	200		0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
SW8260	Benzene, TCLP	mg/L	0.5		0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
SW8260	Carbon tetrachloride, TCLP	mg/L	0.5		0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
SW8081	Chlordane, Technical, TCLP	mg/L	0.03		0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SW8260	Chlorobenzene, TCLP	mg/L	100		0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
SW8260	Chloroform, TCLP	mg/L	6		0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
SW8081	Endrin, TCLP	mg/L	0.02		0.0005 U	0.0005 U	0.00050 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U
SW8081	gamma-BHC (Lindane), TCLP	mg/L	0.4		0.00025 U	0.00025 U	0.00025 U	0.00025 U	0.00025 U	0.00025 U	0.00025 U
SW8081	Heptachlor, TCLP	mg/L	0.008		0.00025 U	0.00025 U	0.00025 U	0.00025 U	0.00025 U	0.00025 U	0.00025 U
SW8270	Hexachloro-1,3-butadiene, TCLP	mg/L	0.5		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
SW8270	Hexachlorobenzene, TCLP	mg/L	NA		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
SW8270	Hexachloroethane, TCLP	mg/L	3		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
SW8270	m-Cresol, TCLP	mg/L	200		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
SW8081	Methoxychlor, TCLP	mg/L	10		0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U
SW8270	Nitrobenzene, TCLP	mg/L	2		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
SW8270	o-Cresol, TCLP	mg/L	200		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
SW8270	p-Cresol, TCLP	mg/L	200		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
SW8270	Pentachlorophenol, TCLP	mg/L	100		0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U
SW8270	Pyridine, TCLP	mg/L	5		0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U
SW8260	Tetrachloroethene, TCLP	mg/L	0.7		0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
SW8081	Toxaphene, TCLP	mg/L	0.5		0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
SW8260	Trichloroethene, TCLP	mg/L	0.5		0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
SW8260	Vinyl chloride, TCLP	mg/L	0.2		0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
				TCLP Metals [3]							
SW6020A	Arsenic, TCLP	mg/L	5		0.010 U	0.010 U	0.010 U	**0.011**	**0.023**	0.010 U	0.010 U
SW6020A	Barium, TCLP	mg/L	100		**1.0**	**1.1**	**0.64**	**0.58**	**1.2**	**0.62**	**0.73**
SW6020A	Cadmium, TCLP	mg/L	1		0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.0020 U	**0.0022**	**0.0054**
SW6020A	Chromium, TCLP	mg/L	5		0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
SW6020A	Lead, TCLP	mg/L	5		0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U
SW7470A	Mercury, TCLP	mg/L	0.2		0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.0020 U
SW6020A	Selenium, TCLP	mg/L	1		0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
SW6020A	Silver, TCLP	mg/L	5		0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U

Notes:
Bold results exceed laboratory reporting limits.
Bold and highlighted results exceed the screening criteria.
bgs = Below ground surface
CFR = *Code of Federal Regulations*
ID = Identification
mg/kg = Milligram per kilogram
mg/L = Milligram per liter
NA = Not available
PCB = Polychlorinated biphenyl
RSL = Regional Screening Level
SVOC = Semivolatile organic compound
TAL = Target Analyte List
TCLP – Toxicity Characteristic Leaching Procedure
U = Not detected at indicated method detection limit
UJ = Not detected at indicated method detection limit, which is considered estimated
U.S. EPA = United States Environmental Protection Agency

1 Screening criteria are U.S. EPA RSLs (formerly preliminary remediation goals) listed in Residential Soil Table dated November 2011.
2 Screening criterion is U.S. Geological Survey average concentration of arsenic in Sandusky County, Ohio.
3 Screening criteria are U.S. EPA requirements for PCB spill cleanup (40 CFR 761.125).
4 Screening criteria are from 40 CFR 261.20, Table 1 – Maximum Concentration of Contaminants for the Toxicity Characteristic.