Planning. Guidance. Protection

Choose Safe Places
for Early Care and Education (CSPECE) Guidance Manual

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TABLE OF CONTENTS

TABLES

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FOREWORD

We know that children routinely face hazards where they live, learn, and play. Many of these hazards originate from interactions with the environment. For example, children may be exposed to harmful chemicals in the air they breathe, the water they drink, or soil they touch or swallow. Because children are still growing and developing, they are uniquely susceptible to health threats from environmental exposures. These early exposures can trigger diseases and disrupt development, learning, and behavior.

As our scientific understanding of children's environmental health issues continues to evolve, so do the policies and practices in place to protect children's health. The Centers for Disease Control and Prevention's National Center for Environmental Health (NCEH) and the Agency for Toxic Substances and Disease Registry (ATSDR) are working to prevent and control harmful environmental exposures that affect children. We are dedicated to protecting America's health.

Protecting communities from hazardous waste exposures is one of ATSDR's key functions. National and state programs exist to ensure safe siting for school age children. Young children are even more susceptible to harmful environmental exposures, but less attention has been paid to the placement of early care and education (ECE) programs. Through our work in communities across the United States, we have seen how the location of an ECE program can affect the health of the children it serves. In the past decade, ATSDR's public health assessment and health consultation activities have evaluated and provided recommendations at dozens of sites where concerns existed about potential environmental hazard exposures for children attending an ECE program. We have applied lessons learned from this site work to develop *Choose Safe Places for Early Care and Education (CSPECE) Guidance Manual.* This manual is a resource to help you keep children in your community safe and healthy in the environments where they grow, learn, and play.

This manual is the result of many people's efforts. I would like to thank all those who contributed to the development of this resource, including the staff of ATSDR and NCEH along with subject matter experts and practitioners from a variety of stakeholder organizations.

We work hard to protect the public's health in America and we hope that you will help us in this effort.

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EXECUTIVE SUMMARY

In the United States, about 8.3 million children younger than five years are cared for in licensed child care facilities [1]. Children may spend 10 hours per day, five days per week in care settings outside their homes [2]. Children may also be enrolled in other programs, such as Head Start. The term "early care and education" (ECE) applies to all of the places where young children may be cared for outside of their homes.

Determining the number of children at risk for harmful environmental exposures across the United States is challenging. Limited data are available to estimate how many ECE programs and children in those programs might be at risk for exposures. Using data from one state and extrapolating it to the rest of the country is one way to try to calculate and estimate, even if it has limitations. Using this strategy, ATSDR estimates that 1.35 million children are in programs that warrant additional evaluation to ensure the site is safe, and about 174,000 children might currently be exposed to harmful contaminants.[1]

When an ECE program is improperly located, consequences can result. Most importantly, children and ECE staff can be exposed to harmful levels of hazardous contamination. Also, the mere presence of contaminants at an ECE program can cause stress and fear among staff and parents, even if exposures are not significant. It can also lead to financial and legal consequences for the ECE program.

ATSDR has worked on sites across the country where ECE programs have been in locations that were not safe. To help protect children from health risks caused by locating ECE programs on or near places where chemical or radiological hazards are present, ATSDR created the *Choose Safe Places for Early Care and Education (CSPECE) Guidance Manual*. This manual offers tools and resources to help state and local public health agencies and other partners build programs to protect children in their communities.

HOW DOES THE CSPECE MANUAL TIE INTO OTHER ECE INITIATIVES?

The CSPECE manual enhances efforts to protect children from environmental exposure by providing a conceptual model for building a safe siting program to address the environmental safety of an ECE site. The Administration for Children and Families (ACF), a division of the U.S. Department of Health and Human Services, is responsible for several programs that directly influence ECE programs across the United States. Two of these programs, the Office of Child Care and the Office of Head Start, recently released updated rules to help ensure the safety of children who attend child care and Head Start programs. These rules are the Head Start Program Performance Standards, and 2016 Child Care and Development Fund Final Rule, which was based on the Child Care and Development Block Grant Act of 2014.

In promulgating these rules, ACF referred to *Caring for Our Children Basics: Health and Safety Foundations for Early Care and Education Settings*, released in 2015. *Caring for our Children Basics* is voluntary guidance which presents the minimum health and safety standards experts believe should be in place where children are cared for outside of their homes—regardless of program or funding stream [3].

Several of the minimum health and safety standards in *Caring for Our Children Basics* tie in with the guidance in this manual. The guidelines presented here can help states or locales in meeting parts of the ACF standards, including sections:

- 4.2.0.6 Availability of Drinking Water.
- 5.1.1.2 Inspection of Buildings.
- 5.1.1.5 Environmental Audit of Site Location [3].

[1] See Appendix D for how these data were calculated and limitations of the data.

This guidance manual provides a conceptual model for building a safe siting program to address the environmental safety of an ECE site. Also, tools and resources are provided that can be used throughout the process of implementing a safe siting program.

WHAT ARE SAFE PLACES FOR ECE?

The location—or site—of an ECE program can influence the types and amounts of environmental exposures to children in the program. Safe siting means locating an ECE program in a setting that is safe from hazardous contaminants that could be present at or near the property or building. The safe siting of an ECE program includes a thorough analysis of the following:

- Former site uses that might have left chemical or radiological hazards on the property (including the building and the land).
- Migration of harmful substances onto the site from nearby properties or activities.
- Naturally occurring harmful substances on-site.
- Drinking water contamination.

ATSDR is directed by congressional mandate to

- Assess the presence of health hazards at specific sites.
- Help prevent or reduce further exposure and the illnesses that result from such exposures.
- Expand the knowledge base about health effects from exposure to hazardous substances [4].

This guidance manual addresses hazardous substances in the environment. ATSDR recognizes that many other environmental and safety issues, beyond the scope of this manual, are important to consider to keep children safe. Appendix A and ACF's *Caring for Our Children Basic*s provide some additional resources and guidance for minimal health and safety guidelines for a range of potential hazards [3].

HOW DOES THE GUIDANCE MANUAL FIT INTO ATSDR'S WORK?

This guidance manual is the cornerstone of ATSDR's work to protect children nationwide from harmful chemical exposures in ECE settings. It provides guidance, policy examples, tools, and resources that can be used to ensure that ECE programs are located on sites where hazards have been considered, addressed, and mitigated to protect children's health.

This manual describes

- Gaps in regulations and policies that can lead to improper ECE siting (Chapter 2).
- Vulnerabilities of children and staff to chemical and radiological hazards from improper siting of ECE programs (Chapter 2).
- Potential hazards resulting from poorly located ECE programs that could put children at risk (Chapter 3).
- What can be done to identify and remediate those hazards (Chapter 4).

In addition, this manual provides

- A conceptual model for developing a program at the state or local level to implement safer siting (Chapter 5).
- Tools (Chapter 6) and resources (Appendix) that can be used throughout the implementation process.

WHO ARE THE STAKEHOLDERS AND HOW CAN THEY USE THIS MANUAL?

Protecting children and workers from environmental contaminants in ECE settings relies on the commitment and expertise of people from various disciplines and sectors. Stakeholders can include

- ECE licensing agencies.
- State, local, territorial and tribal public health and environmental protection staff.
- State, local, territorial and tribal ECE administrators and professional organizations.
- Certification and accreditation organizations.
- ECE program directors.
- Head Start program administrators.
- Planning, zoning, and other land-use decision makers.
- Policy makers.
- Parents and the public.
- Non-governmental partner organizations.

This manual suggests ways stakeholders can use ATSDR's guidance to best protect children from environmental exposures at ECE program locations. Because working together across agencies and sectors is crucial, this manual provides tips on starting and maintaining cross-sector partnerships. It includes case studies that show the effect of siting decisions on ECE programs.

CHAPTER 1: STATEMENT OF PROBLEM, BURDEN, AND MANUAL OVERVIEW

THE PROBLEM

The Agency for Toxic Substances and Disease Registry (ATSDR) created the national *Choose Safe Places for Early Care and Education*[2] *(CSPECE) Guidance Manual* to protect children from health risks caused by locating (siting) and operating early care and education (ECE) programs on or near places where environmental hazards are present. In the United States, about 8.3 million children younger than five years are cared for in licensed child care centers [1]. Children in these programs could be at risk from environmental exposures if the programs they attend are not safely sited.

Until recently, the potential for harmful environmental exposures from the location of ECE programs was not given much consideration. Although every state and the District of Columbia has licensing requirements for ECE programs, what is included in those licensing requirements varies from state to state. Most states do not have licensing regulations that specifically address hazardous environmental exposures that can occur from the location of the ECE program [1].

Improperly siting an ECE facility can have consequences. In particular, children and ECE staff can be exposed to harmful levels of hazardous contamination. The mere presence of contaminants at an ECE program can cause stress, worry, and fear among staff and parents, even if exposures are not significant. It can also lead to financial and legal consequences for the ECE program.

How does this manual fit into other Department of Health and Human Services initiatives?

The CSPECE manual enhances efforts to protect children from environmental exposure by providing a conceptual model for building a safe siting program to address the environmental safety of an ECE site. Also, tools and resources are provided that can be used throughout the process of implementing a safe siting program.

The Administration for Children and Families (ACF), in the U.S. Department of Health and Human Services, is responsible for several programs that directly influence ECE programs across the United States. Two of these programs, the Office of Child Care and the Office of Head Start, recently released updated rules to help ensure the safety of children who attend child care and Head Start programs. These rules are the Head Start Program Performance Standards, and 2016 Child Care and Development Fund Final Rule, which was based on the Child Care and Development Block Grant Act of 2014 (Public Law 113-186). The law identifies minimum health and safety requirements, training requirements, and monitoring requirements to ensure that ECE facilities receiving Child Care and Development Fund financial assistance protect children's health and safety [5]. The reforms will benefit more than 1.4 million children receiving child care subsidies, as well as other children who receive no direct funding [5].

In promulgating the CCDF rule, ACF referred to *Caring for Our Children Basics: Health and Safety Foundations for Early Care and Education Settings,* released in 2015. *Caring for our Children Basics* is voluntary guidance which presents the minimum health and safety standards experts believe should be in place where children are cared for outside of their homes—regardless of program or funding stream [3].

ACF also referred to *Caring for Our Children Basics* in new Head Start Performance Standards. These

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[2] Early care and education (ECE) encompasses child care, family child care homes, Head Start, and pre-K settings. Although this manual can be used to identify potential siting issues at any of these facility types, its focus is on licensed child care facilities. The term "early care and education or ECE" will be used in this manual except for references that only apply to licensed child care facilities or where material from other sources specifically refer to child care or daycare centers and not ECE programs as a defined here.

standards enforce requirements to help ensure the safety of all Head Start programs. The standards state that "A program must establish, train staff on, implement, and enforce a system of health and safety practices that ensure children are kept safe at all times. A program should consult Caring for our Children Basics..." [6].

The ATSDR CSPECE guidance manual relates to several of the standards contained in *Caring for Our Children Basics*, including the following:

- 4.2.0.6 — Availability of drinking water.
- 5.1.1.2 — Inspection of buildings.
- 5.1.1.5 — Environmental audit of site location.

The CSPECE guidance manual can help states or locales in addressing the standards included in *Caring for Our Children Basics* by

- Describing how environmental exposures can happen at ECE programs.
- Providing a conceptual model for building a local or state level program to address safe siting.
- Providing tools to help in screening sites.
- Providing resources that can be used throughout the implementation process.

Public Health Burden and Impact: Current Knowledge from Two States

Determining how many ECE programs are improperly sited is challenging. The experiences of two states provides some information on the scope of the problem.

In 2007, the Connecticut Department of Public Health (CT DPH) created its Child Care Screening Assessment for Environmental Risk (SAFER) Program. The SAFER Program finds ECE programs on or near properties where the presence of hazardous chemicals could harm children. It also strives to raise awareness at the state and local level about ECE program siting. CT DPH receives approximately six referrals each year for follow-up regarding environmental concerns. On average, one child care program of the six has potential problems warranting environmental assessment. Between 2007 and March 2016, the SAFER Program has

- Addressed 46 ECE program referrals for site-related concerns affecting about 800 children.
- Determined that 10 of the 46 referrals required more data to assess the site.
- Recommended that five programs take actions to prevent potential harmful exposures for 87 children [7].

Given that CT DPH's program is voluntary, the total burden in the state might be greater.

The state of New Jersey passed detailed regulatory requirements in 2007 relating to environmental conditions at the site of child care facilities in the state. Between 2007 and March 2016, among 3,939 licensed child care centers in New Jersey

- 671 centers (17%) were identified where actual or potential air exposures of concern were possible from incompatible prior use or co-location with a contaminated waste site, dry cleaners, nail salon, or another site.
- 422 (11%) had air contaminant levels above the New Jersey Department of Environmental Protection's screening values, which resulted in further evaluation.
- 87 (2.2%) child care centers had possible harmful exposures and action was needed [8].

In New Jersey and Connecticut, about 6,000 children have been protected from harmful exposures to contaminants identified at ECE sites since 2007.

ATSDR has worked on sites across the country where ECE programs have been in locations that were not safe. Most sites come to the attention of ATSDR after the exposure has been recognized. Determining the

number of children at risk for harmful environmental exposures across the United States is challenging. Only limited data are available to estimate how many ECE programs and children in those programs might be at risk for exposures. Using data from one state and extrapolating it to the rest of the country is one way to try to calculate and estimate, even if it has limitations. Using this strategy, ATSDR estimates that 1.35 million children are in programs that warrant additional evaluation to ensure the site is safe, and about 174,000 children might currently be exposed to harmful contaminants.[3]

MANUAL OVERVIEW: WHAT IT COVERS AND HOW TO USE IT

This guidance manual will help state and local agencies better protect children from the hazards posed by improper siting of ECE programs. It provides guidance, model program, policy approaches, tools, and resources that can be used to ensure ECE programs are located on sites where hazards have been considered, addressed, and mitigated to protect children's health.

This manual describes

- Gaps in state and local regulations and policies that can lead to improper ECE program siting (Chapter 2).
- Vulnerabilities of children and staff of ECE programs to chemical and physical hazards from improper siting (Chapter 2).
- Potential hazards resulting from poorly located ECE programs that could put children at risk (Chapter 3).
- What can be done to identify and remediate those hazards (Chapter 4).

The manual provides

- A conceptual model for building an interagency program at the state or local level to implement safer siting (Chapter 5).
- Tools (Chapter 6) and resources (Appendix A, B, and C) that can be used throughout the implementation process.

ISSUES NOT DIRECTLY ADDRESSED IN THIS DEFINITION

ATSDR is directed by a congressional mandate to evaluate the effects of environmental exposure on public health [4]. This includes the following:

- Assessments of contaminated sites.
- Health consultations concerning specific hazardous substances.
- Health surveillance and registries.
- Response to emergency releases of hazardous substances.
- Applied research in support of public health assessments.
- Information development and dissemination.
- Education and training concerning hazardous substances.

Many other environmental and safety issues for ECE programs are outside the scope of ATSDR's mandate and this manual. For example, physical hazards on a site, such as open bodies of water, protection from the sun, second-hand smoke, or pedestrian safety, are not addressed. Many of these other health and safety issues are addressed in *Caring for Our Children Basics: Health and Safety Foundations for Early Care and Education Settings* from ACF [3] and by guidance produced by other groups, such as the Children's Environmental Health Network. Please see Appendix A for more information.

[3] See Appendix D for how these data were calculated and limitations on the data.

TAKING ACTION

Protecting children from environmental hazards in the ECE setting relies on the commitment and expertise of people from various disciplines and sectors. The table below summarizes the potential ways that key stakeholders can use this manual to best protect children from chemical and radiological hazards at the location of the ECE program.

Table 1.1. 1 How key stakeholders can use this manual to Gain Knowledge

Key Stakeholders	Understand the issue and why it is important (Chapters 1,2)	Understand the key components of a safely sited ECE program (Chapters 2,3)	Check with ECE provider to see if an environmental assessment has been conducted and if any risks have been mitigated properly (Chapter 4)	Form relationships with licensing staff (Chapters 5,6)
State, local, territorial and tribal health agencies	X	X	X	X
ECE licensing agency	X	X	X	
Certification and accreditation associations and organizations	X	X	X	X
ECE providers	X	X		
Planning, zoning, and land use decision makers	X	X	X	
Non-governmental partner organizations	X	X		
Parents and the public	X	X	X	

Table 1.1. 2 How key stakeholders can use this manual to Build Relationships

Key Stakeholders	Form relationships with licensing staff (Chapters 5,6)	Develop relationships with state environmental health staff and other stakeholders (including ATSDR's Cooperative Agreement Program grantees) (Chapters 5,6)	Review and modify tools to fit the needs of the state, organization, jurisdiction, or business (Chapter 6)
State, local, territorial and tribal health agencies	X		X
ECE licensing agency		X	X
Certification and accreditation associations and organizations	X	X	X
ECE providers			X
Planning, zoning, and land use decision makers		X	
Non-governmental partner organizations		X	
Parents and the public			

Table 1.1. 3 How key stakeholders can use this manual to Educate Others

Key Stakeholders	Educate providers and other stakeholders regarding ways to ensure that programs are safely sited (Chapters 5,6)	Educate parents, ECE programs, and decision makeres about safe siting initiatives at the state, jurisdiction, or organization level (Chapters 5,6)	Disseminate information on locations of known contaminated sites (Chapter 4)	Provide expertise on environmental assessment and mitigation to ECE licensing agency and ECE programs (Chapters 5,6)
State, local, territorial and tribal health agencies	X	X	X	X
ECE licensing agency	X	X	X	
Certification and accreditation associations and organizations	X	X		
ECE providers		X		
Planning, zoning, and land use decision makers			X	
Non-governmental partner organizations	X	X		
Parents and the public	X			

Table 1.1. 4 How key stakeholders can use this manual to Inform Policy

Key Stakeholders	Incorporate guidance into policies, planning and permitting decisions, regulations, licensing practices and policies, standards, guidance, and business practices (Chapters 5,6)	Incorporate the key concepts from this guidance into decisions about locating ECE programs (Chapters 5,6)	Review and modify tools to fit the needs of the state, organization, jurisdiction, or business (Chapters 5,6)
State, local, territorial and tribal health agencies	X	X	
ECE licensing agency	X	X	
Certification and accreditation associations and organizations	X[4]	X	X
ECE providers	X	X	
Planning, zoning, and land use decision makers	X	X	
Non-governmental partner organizations			X
Parents and the public			

CROSS-SECTOR RELATIONSHIP BUILDING

Working together across agencies and sectors is key to successfully protecting young children in ECE settings. Here are a few tips on starting and maintaining cross-sector partnerships [9] [10] [11] [12]:

- **Find core values** between partners and agencies as a starting point.
- **Build personal relationships, be flexible, and find a shared language.**
- Have a **well-structured partnering process** with well-defined objectives, whether it is developing a workgroup, joining an existing reoccurring meeting, or developing something more formal, such as a memorandum of understanding (MOU).
- **Persist.** Multi-sector partnerships are not easy and can take time, but ultimately more can be achieved together than alone.

Appendix A lists resources for more information about cross-sector partnership building.

[4] Providers should consult with local or state departments of health and environment for guidance on any mitigation and exposure reduction technologies and methods the provider might consider using.

CHAPTER 2: BACKGROUND

According to the National Association for Regulatory Administration, approximately 9.8 million children younger than five years are cared for on a regular basis outside the home by non-relatives. Of these, about 86% or 8.3 million children are in licensed child care facilities [1]. Additionally, an estimated one million children are enrolled in Head Start programs [13].

The term early care and education (ECE) can include many different places where children are cared for outside of their homes. ECEs can include child care centers, family child care homes, Head Start, day-care, preschool, and pre-K. The children in these programs are very young—about five years old or younger [14]. Many of these places are licensed by states to provide safe care for children.

For this guidance manual we will be using the term early care and education (ECE) programs to describe places where children are cared for outside their own home.

This definition can include places that go by many names, such as

- Child care
- Family child care homes
- Head Start
- Pre-K
- Preschool
- Daycare

Some children spend up to 10 hours a day, five days a week, in care outside of their home [2]. Families rely on ECE programs to safely care for their children while adults in the family work. When child care is not available, it can cost families their paychecks and reduce business productivity. Employee absenteeism as a result of lack of child care costs U.S. businesses $3 billion a year [15].

Physiologically, children are not just small adults.

Their rates of breathing and breathing zone are different than adults.

Their metabolic rates are higher relative to their size.

They have a larger ratio of surface area to body mass.

These and other physiological differences, combined with rapid body development, can make children more vulnerable when exposed to environmental contaminants.

SUSCEPTIBLE POPULATIONS

Children who attend ECE programs and staff at the centers are vulnerable to the health effects of exposure to chemical or radiological hazards. Children are particularly sensitive and susceptible to exposures to chemical contaminants. Children undergo many different and rapid stages of growth and development before age five years [16]. During these stages, organ systems, including the brain and lungs, can easily be disturbed by environmental contaminants [17]. Children's bodies might not readily repair such damage, which might affect their health now and later in life. Moreover, young children are more vulnerable because they are less likely to use health protective behavior, such as washing their hands. They also might not recognize the difference between safe and unsafe items or know to avoid unknown things or substances.

Children have a less diverse diet than do adults. Children's proportional intake of food and drink is greater than that of adults. Because of this, any chemical contaminants, metals, natural toxins, and pesticides found in specific food and beverages are taken in at a greater proportion by infants and children. During ages 18–21 months, infants drink 10 times more water per kilogram of body weight daily than do adults [16]. In the United States, children ages one through five years eat three to five times more food per kilogram of body weight than the average adult [17].

Also, children have a faster breathing rate than adults. They also breathe air that is closer to the ground than do adults. These differences mean that children might be exposed in greater proportion to contaminants in the air that are closer to ground level. For example, if mercury is spilled on a carpet, the mercury vapor levels at the height where a toddler is breathing may be much higher than at the height at which an adult is breathing.

Finally, children and infants spend a lot of time playing on the ground where chemical contaminants can accumulate in the dust or the soil. Children's potential for exposure to chemical contaminants is increased by their behaviors, such as crawling, mouthing hands and objects, and other hand-to-mouth behaviors [2].

Pregnant ECE workers are another susceptible population because some exposures to chemical contaminants can harm fetal development. Most ECE programs are staffed by women of child-bearing age. About 95% of child care workers are women [18]. Helping make ECE programs safer protects the children who attend the centers and unborn children of women who work at the centers.

ENVIRONMENTAL HAZARDS IN THE ECE SETTING

In the broadest sense, the environment is anything outside of a person. The effect of the environment on children's health is a concern shared by parents, ECE program workers, and public health professionals. Within the entire ECE program setting, many hazards might be present and easy to identify. Hazards include cleaning supplies, play structures, medications for children, art supplies, and many other useful and necessary items. Other environmental hazards might not be easily identified and can come from sources such as drinking water, soil, and the air. This guidance manual provides tools and resources to identify sources of environmental contamination that might harm the health of children and their caretakers because of where their ECE program is located. To ensure children are safe from injury or illness while in an ECE setting, states have program licensing regulations to protect the health and safety of children. Individual programs might also have internal policies or follow best practice guidance beyond what is regulated by their state.[5] These practices are critical to keeping children safe, but they are often not focused on environmental exposures that can occur because of where the ECE program is located.

Poor siting decisions can result in children being exposed to indoor or outdoor chemical contaminants in soil, water, and air. These chemical contaminants can come from sources on the ECE program property or nearby sites. It is important to protect children from a wide variety of environmental contaminants, including lead, arsenic, asbestos, polychlorinated biphenyls (PCBs), pesticides, perfluoroalkyl substances (PFAS), volatile organic compounds (VOCs), mercury, and radon.

If an environmental problem is discovered at an ECE program, it can create stress, worry, and fear among parents. Depending on the contaminant, duration, and level of the exposure, the hazard can harm children and staff. Such exposures can cost ECE program providers and states money in legal fees, liability, and expenses to remedy the problem.

Environmental hazard assessments can help prevent children from being exposed to environmental contaminants. For example, an environmental assessment may reveal that a proposed ECE site is in the same building as a dry cleaner and that the chemicals from the dry cleaner could affect the air quality in the ECE program. An assessment of business uses near the ECE site could prevent this type of exposure. Similarly, if an ECE program opens on a former industrial property that was not properly cleaned up, chemical contaminants from the former industry could be in the soil. Children could be exposed to chemical contaminants in the soil while playing. An assessment of the past use of the property could prevent this type of exposure.

[5] Head Start programs have federally mandated practices that might go beyond the state in which a program is located.

In some communities that face a heavy burden of environmental exposures, the need to keep ECE programs on safe sites is especially critical. Children in communities with a heavy burden of environmental exposures might face environmental exposures from old housing materials, unaddressed abandoned or hazardous sites, industrial facilities, and other undiscovered environmental hazards. Environmental exposures at ECE programs only add to their burden of exposure. Many conditions in a community are extremely challenging to change, but helping to ensure ECE programs are as safe as possible requires few additional resources. Protecting children in these communities helps protect some of the most vulnerable children in our nation.

LICENSING REQUIREMENTS

Although each state has specific and unique requirements for licensing ECE programs, the 2015 *Caring for our Children Basics* guidance describes the minimum health and safety standards that should be part of the licensing process. *Caring for our Children Basics* is now tied to the new Head Start Program Performance Standards and the Child Care and Development Fund Final Rule. These rules require ACF block grant licensed providers and Head Start programs to have a pre-licensure and annual inspection for compliance with health, safety, and fire standards [5].

Although *Caring for our Children Basics* covers a range of potential hazards that need to be considered, it takes time for new guidance to gain traction. The *50 State Child Care Licensing Study, 2011–2013 edition,* found that only about half the states have some type of environmental health inspections [14]. The study defines environmental inspection as "an inspection of licensed settings conducted by the health department or similar entity for compliance with the state and municipal environmental health codes and laws" [14].

These inspections are critical to protecting children from many types of hazards, including fires, injuries, poisonings, and infectious disease. Unfortunately, this definition of environmental inspection is often too vague to catch many potential problems, e.g., presence of a nearby drycleaner, caused by the location of an ECE program. Licensing requirements often do not include a broader consideration of chemical contaminants in the environment and conditions at or nearby a site where an ECE program will be located.

When an ECE facility is being built, moved, or licensed, ask the following questions:

"What was the site before it was an ECE program?"

"What type of businesses are adjacent to this ECE program?"

"What are the nearby environmental conditions?"

In 2015, the Environmental Law Institute reviewed the child care licensing requirements of all 50 states. It found that some states have requirements for inspections for specific chemical contaminants such as lead-based paint, radon, and asbestos. However, across the country, most ECE programs are not required to conduct a site history, environmental audit, or any other type of environmental assessment to obtain a license [19]. As of 2015, only two states, New Jersey and New York, had specific language in their regulations that required locations for ECE programs be chosen with consideration for environmental hazards. Several other states had general provisions prohibiting health or environmental hazards in the area [19]. Most requirements were not specifically targeted at assessing and preventing environmental exposures to children that might occur because of the location of an ECE program.

ECE program providers follow licensing requirements and frequently go beyond those requirements to keep children safe. However, many environmental issues are not under the direct control of the ECE

program provider, and providers might not be aware of past or nearby sources of contamination. When ECE programs are placed in, on, or near hazardous sites, the cause is usually a lack of awareness about the past use and nearby uses of ECE program locations, or the hazards caused by such past or nearby uses.

DIFFERENCES BETWEEN SCHOOLS AND ECE SITING

Much work has been done since the mid-2000s to raise awareness about school siting issues [20]. In 2011, the U.S. Environmental Protection Agency (EPA) released national voluntary school siting guidelines. The guidelines helped to raise awareness about where schools were located within communities and how the location of the school could affect children's health. The EPA guidelines are available at https://www.epa.gov/schools/school-siting-guidelines.

Although school and ECE programs have many similarities, some important differences create siting considerations and challenges that are unique to ECE settings. The first key difference is that children are voluntarily enrolled in ECE, whereas attending school is mandatory. This voluntary enrollment makes it harder to track and determine the number of children in ECE programs and the number of ECE programs.

Second, many ECE programs are privately owned and operated as businesses. As such, ECE programs can be placed in buildings that are zoned for businesses, such as office buildings, strip malls, or mixed development facilities. Unlike schools, ECE programs do not generally go through a public input process. Without much public input, an ECE program might be placed inappropriately, without parents or the center operator realizing it.

Finally, most ECE programs must meet specific licensing requirements within their state to be allowed to provide care for children. These licenses require inspections and renewals that provide opportunities to catch potential problems. Schools are not licensed in this manner.

Table 2.1. Differences between schools and ECE programs

ECE Programs	Schools
Often privately owned	Often publicly funded, some private
Considered businesses and allowed to be placed in areas zoned for "commercial" or "business" use	Often not allowed in "commercial" or "business" zones
Often no public input into the process of placing, building, expanding, or renovating	Often local public input into the process of placing, building, expanding, or renovating
Frequently licensed by state	Mostly not licensed, accredited
Younger children (infants to five years)	Older children (four through five years to 18 years)
Longer hours	Shorter hours
Voluntary attendance	Mandatory attendance

ATSDR'S CHOOSE SAFE PLACES FOR ECE

ATSDR and state partners evaluate and respond to environmental exposures when an ECE program is found to be located on or next to a contaminated site. In the past decade, ATSDR has worked on many of these sites. In several high-profile cases, ECE programs were placed on or next to contaminated sites. One of the most well-known is Kiddie Kollege child care in New Jersey.

KIDDIE KOLLEGE CASE STUDY

A Lesson In Why Siting Is Important

In 1994, Accutherm, Inc., a mercury thermometer factory in New Jersey, filed for bankruptcy and shut down its operations. Under New Jersey environmental laws, Accutherm was responsible for cleaning the mercury pollution at the site. When Accutherm failed to comply, New Jersey referred the site to the federal Environmental Protection Agency (EPA). EPA concluded that the site did not pose an immediate threat to human health because the mercury pollution was contained within the building and the building was vacant. For this reason, the site was put on a list of low-priority sites [55].

Property Sale but No Mercury Cleanup

In 2001, a local realtor purchased the Accutherm property and renovated the building. In 2004, Kiddie Kollege leased the space from the property owner. Before opening, Kiddie Kollege was granted local permits and met all of the New Jersey daycare licensing requirements in place at that time — even though the mercury contamination had not been cleaned up [54].

Daycare Opens, Children Exposed to Mercury

In 2004, Kiddie Kollege opened inside the former Accutherm thermometer factory. During the first two years, young children and child care workers breathed mercury vapors each day they were inside this building. Mercury can be toxic to the nervous system, lungs, and kidneys. In 2006, during an inspection of low-priority sites, the New Jersey Environmental Department realized that the Accutherm property was not vacant but was being used for a daycare. This finding prompted New Jersey to test the air inside the daycare for mercury. Testing confirmed mercury vapors in the air at levels above health guidelines [51]. At this point, the daycare was closed. Parents were concerned for the health of their children as they scrambled to find alternative child care.

Children, Adults Tested for Mercury Exposure

The Agency for Toxic Substances and Disease Registry worked with New Jersey to provide mercury testing for the 72 children and nine staff members who had been attending and working at Kiddie Kollege. About one-third of the children and adults who were tested had mercury in their urine at levels greater than what is considered to be a normal range by the Centers for Disease Control and Prevention [51].

Misunderstandings and Missed Opportunities for Communication

This incident occurred through a series of miscommunications and missed opportunities for communication [54]. Local permitting and daycare licensing staff did not fully communicate with New Jersey's Environmental Department, who knew the Accutherm site was still contaminated. New Jersey's Environmental Department did not have a good procedure for sharing information about contaminated sites [54]. EPA's conclusion that Accutherm did not pose an immediate threat to health might have been misunderstood as meaning that the property was safe for a daycare.

Financial and Legal Consequences, Health Concerns

The legal and financial fallout from the Kiddie Kollege incident has been long-lasting. In 2014, a judge ordered the Accutherm property owners to pay $6.1 million in cleanup costs and punitive damages to the state of New Jersey [53]. Parents' concerns about long-term health effects fueled a class-action lawsuit. The lawsuit settlement of $1.6 million provides money to fund a long-term medical monitoring program for exposed children [52].

The Kiddie Kollege story shows that a poor child care siting decision can lead to enormous financial and legal consequences, as well as long-lasting concerns about health effects. Several methods suggested in this manual for evaluating the history of former use of a building or land where a potential child care center is proposed could have prevented Kiddie Kollege from locating in a former mercury thermometer factory.

With increased awareness, health professionals can work to dramatically decrease the potential for these situations to occur. Adoption of safe siting considerations into the process for selecting ECE locations and licensing ECE programs can protect young children by reducing and preventing harmful environmental exposures.

ATSDR's Choose Safe Places for Early Care and Education ensures that ECE programs are located in places where chemical and radiological hazards have been considered, addressed, and mitigated to best protect children's health.

Many of the programmatic and policy changes offered in this manual can be enacted with little or no additional resources. Many actions to protect children from exposures can be accomplished simply by increased collaboration and communication between state or local agencies and ECE programs.

In addition to providing the ideas and tools in this manual, ATSDR is available to provide technical assistance and expertise to state, territorial, local and tribal agencies or departments. ATSDR has regional offices located around the country and headquarters in Atlanta ready to assist. Regional contact information can be found at: https://www.atsdr.cdc.gov/dro/index.html.

CHAPTER 3: WHAT DOES SAFE SITING INCLUDE?

Locating ECE programs on sites free of chemical and physical hazards or where those hazards have been identified and addressed best protects children's health.

When an ECE program is being sited, it is important to determine whether the location is affected by past activities or hazardous substances from nearby sources or land uses. The following four key considerations come from ATSDR's experiences working on ECE siting issues and are described in detail in this chapter. A thorough consideration of these four key elements can help ensure that exposures do not reach unsafe levels.

Key Considerations for ECE Safe Siting

Former uses of the site that might have left harmful substances

Migration of harmful substances onto the site from other sites, nearby infrastructure or activities

Presence of naturally occurring harmful substances

Access to safe drinking water

FORMER USES OF THE SITE

Past uses of a site can leave contamination on the property that exposes people who are currently using the site. Some contaminants left on a site might disappear quickly and others might stay on the site long into the future. In many urban and suburban areas, it might be hard to find sites for ECE programs that were never used for some industry or business. Reuse of a site is in many cases a good use of land and buildings within a community. Even if a site seems clean or unused, it might not be free of chemical or radiological hazards. It is important to take the proper steps in determining whether or not a site is suitable for an ECE program. When deciding whether to locate an ECE program on a site used for other activities, consider the following:

- Prior activities at the site that could have contaminated the inside of buildings (examples: manufacturing or funeral home).
- Contamination of the outdoor environment, such as soil, surface water, or groundwater (examples: auto junk yard or residual pesticides from farming).
- Prior use, storage, or disposal of potentially hazardous substances on site (examples: a dump site or underground storage tank).
- Existing or former structures on the property that contain or once contained harmful substances (examples: storage shed, underground storage tanks).
- Physical hazards that could be evidence of contamination that may still be on site (examples: abandoned wells or debris).
- Potentially hazardous building materials in structures on the site (examples: asbestos insulation, PCBs in light ballasts or caulk, lead-based paint).

Not all past site use will present a problem for current ECE program sites. Identifying those sites with a problematic past use that might produce harmful environmental exposures is critical to protecting children.

- Use of contaminated fill on the site anytime in the past.
- Vapor intrusion of chemical contaminants in groundwater or soil from past activities on the site (example: former dry cleaners).[6]

Chapter 4, Former Uses of Site, has more information and examples of types of former use that could have left contamination on-site.

MIGRATION OF HARMFUL SUBSTANCES

Former use of a site is not the only potential contributor to environmental contaminants. When considering a site for an ECE program, it is important to observe nearby sites and activities that might create environmental exposures.

Some nearby sites that might warrant attention include the following:

- Designated hazardous sites (examples: National Priorities List or Superfund sites, state listed sites, brownfields properties, other hazardous waste sites).
- Nearby business, service, or facility that might release hazardous materials into the environment (examples: auto repair, hair or nail salon, gas station, factory, farm).
- Transportation infrastructure that could result in a greater risk of hazardous exposures (examples: rail routes carrying harmful substances, transportation transfer points, trucking facilities).
- Threats posed by chemical contaminants migrating on-site from run-off, flooding, wind erosion, or vapor intrusion.

Contamination can come from a source nearby, such as a gas station, and migrate onto the ECE program site through air, water, or soil.

Chapter 4, Nearby Sites, has more information and examples of types of nearby sites that might cause environmental exposures.

NATURALLY OCCURRING CONTAMINATION

In some places, hazardous substances on a site can be naturally occurring, meaning it was not manufactured or created by human activities. Radon is a well-known naturally occurring hazardous substance that can enter into indoor air from radioactive decay of uranium ores and other rock. Other, less often considered, naturally occurring contaminants also can affect a property.

Naturally occurring contamination can be as hazardous as contamination from human activities. Naturally occurring contamination should be considered to ensure safe ECE programs.

Naturally occurring contaminants of various types might be in the soil, water, or air on or near a site, as in these examples:

- Soil—might contain asbestos or arsenic.
- Groundwater used for drinking—might contain arsenic.
- Indoor air—might contain radon.
- Outdoor air—might contain asbestos.

Naturally occurring chemical contaminants might be on the ECE program site or a nearby site. If on a nearby site, the chemical contaminants might eventually migrate to the ECE site at levels that could cause harm to children or facility staff.

[6] For more information on vapor intrusion, see https://www.atsdr.cdc.gov/docs/atsdr_vapor_intrusion.pdf and https://www.atsdr.cdc.gov/docs/atsdr_vapor_Investigation.pdf

Chapter 4, Naturally Occurring Contaminants, has more information and examples of naturally occurring chemical contamination that might cause environmental exposures.

ACCESS TO SAFE DRINKING WATER

Safe drinking water is critical for the health and well-being of children and staff in an ECE program. Children are especially vulnerable to chemical contaminants in drinking water because they consume more water for their body size than do adults.

Contaminants can get into drinking water from a variety of sources, activities, or problems including naturally occurring minerals, agricultural fertilizers and pesticides, manufacturing and industrial processes, sewer overflows, or septic systems. Drinking water can become contaminated with lead, copper, or other chemicals as it travels through pipes to the faucet [21].

For infants, drinking water can be a large portion of their diets by volume when water is used to make infant formula.

ECE program operators have a need to know where the drinking water used in their facility comes from. Where the water comes from will dictate who is responsible for maintaining the quality and safety of the water. Water systems are generally classified as community public water systems; non-transient, non-community water systems; or private water systems.

Steps to ensure safe drinking water include the following:

- Test water regularly if your water is not regulated by the federal or state government, such as water from a private well (check with your state or local health department for guidance on what to test for, how often to test, and how to treat your water if needed).
- Assess the possibility of contamination from pipes or water infrastructure.

Chapter 4 has more detailed information on water systems and safe drinking water.

ISSUES NOT DIRECTLY ADDRESSED IN THIS DEFINITION

ATSDR recognizes that many of these other environmental issues are important concerns to consider in keeping children safe. Some environmental issues not addressed include use of artificial turf or cleaning products, sun safety, and proximity to busy roadways. Although these issues are not directly addressed in this manual, Appendix A provides resources about these topics.

HOME-BASED CHILD CARE

This manual targets ECE programs not located in private homes. Early care and education programs, outside of private homes, generally care for larger numbers of children than do home-based ECE programs. Also, larger ECE programs are generally located in business or commercial structures in non-residential areas. In contrast, home-based ECE programs are generally operated in homes in residentially zoned areas. Therefore, home-based ECE programs might be less likely than other programs to be located on properties with a past industrial use.

Home-based ECE programs are also less likely to be located in the same building as or near an operating business, such as a nail salon or auto body shop, that could cause harmful exposures in the ECE programs. Licensing and local permitting requirements for home-based ECE programs also might be different from requirements for other ECE programs. It is prudent to be aware of the site history for all ECE programs, especially for new construction.

Although this manual has been written primarily for larger, licensed ECE programs, the approaches and tools can be applied to home-based ECE programs, schools, and other places. Home-based ECE programs are not immune from environmental contaminant problems or poor siting decisions. For example, groundwater contamination from a business such as a gas station could migrate into a residential area.

Naturally occurring chemical contaminants in groundwater can affect home-based ECE program locations. In fact, groundwater contamination might be even more of a concern for home-based ECE programs that use well water than for larger ECE programs that use well water. This is because private water supply systems that serve fewer than 25 people are unregulated. In contrast, larger ECE programs with well water are more likely to be public water supply systems (because they care for larger numbers of children than home-based ECE programs). As such, these wells would have more requirements for water testing than private wells.

Users of this manual can consider how the tools and approaches it presents can be applied to ECE programs and home-based locations to protect children in these settings from harmful chemical exposures.

OTHER LICENSED FACILITIES WHERE CHILDREN ARE LOCATED

In some states, group homes, camps, and other facilities are also licensed and inspected by state or local entities as places where children may spend a significant amount of time. Although this document was written for a different audience, the principles of safe siting could apply to these other facilities as well. In states where group homes are licensed by the same agency that licenses ECE programs, consideration may be given to including these facilities in any new policy or program changes to help ensure these facilities are in safe locations.

CHAPTER 4: ELEMENTS OF ENSURING SITES ARE SAFER

This chapter discusses each of the four elements of safe siting in greater detail, building off the ATSDR definition of safe siting for ECE programs. For each of the safe siting elements, this guidance manual lists examples of

1. Potential problem sites.
2. Suggested actions to help identify potential problem sites.
3. Potential partners and the support they might be able to provide.
4. Sample policies to help guide siting of ECE programs.

Much of this information is similar across each of the four elements of site siting.

Four elements of safe siting to consider

1. Former use of the site
2. Nearby sites and nearby activities
3. Naturally occurring contamination
4. Safe drinking water

FORMER USE AND NEARBY SITES

ATSDR has worked on dozens of sites where ECE programs were adversely affected because of contamination on the site or from nearby sites. Often, the ECE programs were placed on these problematic sites without anyone spotting the potential for environmental exposure until after the children were exposed. Sometimes this exposure might have been avoided if someone had asked, "what was this site used for in the past?" and "what is nearby?" These questions can be a simple starting point to determine if a site is a good choice for an ECE program.

Asking the questions *"what was on this site in the past?"* and *"what is adjacent to the site?"* are critical steps to determining if a location is safe for an ECE program.

Any site that once had known or suspected use, storage, or dumping of hazardous materials deserves scrutiny. Contaminants can stay on a site long after the activities that caused the contamination have stopped. Some sites can be easily identified because they appear on a list (federal or state) of known contaminated sites. Other sites are harder to identify because the contamination on the site has not yet been characterized. Identifying these "not yet known" sites requires some extra investigation to determine past uses of the site. Along with outdoor contamination, consider possible contamination inside any structures on the site. A structure known to have housed industrial or manufacturing activities deserves careful consideration to ensure that no contamination from those activities remains in the building. For example, ATSDR worked on a former mill site where space inside the building was rented to a batting cage business that catered to children. Former manufacturing in the building had left chemical contamination in the soil under the building. These chemicals included perchloroethylene (PCE) and trichloroethylene (TCE). Indoor air concentrations of PCE and TCE from vapors traveling up from the soil into the building were high enough to alarm parents and cause the business to relocate.

Some buildings are easier to identify as potentially problematic than are others. For example, a building that looks like an old mill or that has large delivery doors on loading docks is likely a building that was not initially designed to have children occupying it. Past uses of other buildings might not be so obvious. For example, a funeral home might have been located in what now appears to be just an old house.

Contamination on an ECE site can also come from a nearby site. Some chemical contaminants can migrate onto the ECE site in groundwater, surface water, or air.

Proximity to a contaminated site is not the only factor in determining if an ECE program is properly located. Another factor is the potential for exposure to the contaminants. For example, if soil two feet below the surface on a nearby site is contaminated, but the site is fenced, and children have no contact

with that soil, then the children are not being exposed to those contaminants in that soil. However, if an ECE program is located in a building that also houses a dry cleaner, children could be exposed to chemicals in the air, depending on how air moves through the building or where the exhaust exits.

Contaminants from nearby sites can also lead to exposures on an ECE program site by moving through groundwater and creating an indoor air hazard from vapor intrusion. Vapor intrusion is the process by which contamination in the soil or groundwater enters indoor air spaces. Some hazardous substances, such as VOCs, are more likely to create an indoor air hazard than others. If soil or groundwater contamination is suspected, the possibility of vapor intrusion should be considered for any occupied structures on the ECE site.

For more information on vapor intrusion, see the ATSDR fact sheets available at

https://www.atsdr.cdc.gov/docs/atsdr_vapor_intrusion.pdf
https://www.atsdr.cdc.gov/docs/atsdr_vapor_investigation.pdf

Based on experience working on contaminated sites, ATSDR developed a list of site activities that warrant special attention to ensure an ECE program site is safe for children (Appendix E). The list includes examples of sites where past activities on the site and adjacent activities to an ECE program might be of concern. Some sites not included on this list might also present a hazard to children. Additionally, as research and science progress, existing hazards might be more fully characterized, and new hazards might be discovered.

CASE STUDIES

The below case studies highlight former uses of sites or types of nearby sites that might be a cause for further examination when making ECE siting decisions (see Appendix E). Checks for potentially incompatible businesses prior to siting may have led to regular monitoring or placement of the ECE facility in another location, thereby preventing exposures.

Former Use Concern: Matchbox Daycare—Indiana, 2005

Matchbox Daycare was located in a large, one-room facility that also housed a church. The building is located on property that was used for a manufactured gas plant in the late 19th century. The site had also been used by a print shop and might have had other uses.

Indoor air samples collected by the Indiana State Department of Health detected VOCs within the daycare and the church section of the building. Inspectors determined that the indoor air concentrations of the contaminants did not pose a health concern for the children and workers at the daycare. However, because of the presence of VOCs and the concerns it raised, the daycare and the church decided to change locations [22].

Former Use Concern: Head Start Program—ATSDR Region 2, 2012

In 2012, a site where a Head Start program was located was identified as having potential contamination with VOCs in the soil and air beneath some buildings where businesses might have used these chemicals in the past. Soil gas samples underneath a building (sub-slab) were analyzed for PCE, TCE, and dichloroethylene (DCE) from under a building that housed the Head Start program. Generally, concentrations found in sub-slab testing are greater than the concentrations occupants of the building are exposed to in indoor air levels. Indoor air concentrations, can however, be modeled based on sub-slab results.

At this facility, the PCE air concentrations estimated for the Health Start program exceeded the ATSDR acute minimal risk levels for neurological effects and created a possible increased cancer risk for children and adults. Also, the PCE, TCE, and DCE levels all exceeded the ATSDR chronic minimal risk levels for

neurological effects. ATSDR recommended that indoor air sampling of the facilities on the property be conducted as soon as possible to capture accurate results.

Contaminants at the site caused a great deal of concern for health professionals and for the parents whose children attended the Head Start program. On ATSDR's recommendations, further indoor air testing was completed. The indoor air testing revealed that the indoor air concentrations were below a health concern. A concern was that indoor air concentrations could rise in the future if environmental conditions changed. Because of increased awareness and the potential risk, the Head Start program was relocated [23].

Nearby Use Concern: Tutor Time Daycare Center—New York, 2002

In late February 2002, parents whose children had attended or were still attending the Tutor Time Daycare Center, in Mineola, New York, contacted the New York State Attorney General's office with concerns about contaminants at the site. The daycare center was located among commercial and light industrial buildings, and parents had recently learned that it abutted the Jackson Steel Superfund site.

Sampling by the Nassau County Department of Health (NC DOH) and EPA had shown elevated indoor air levels of tetrachloroethylene (PCE or perc), a common industrial solvent and a fluid used in dry cleaning, inside the daycare [24]. The levels detected were above the New York State Department of Health (NYS DOH) indoor air guideline of 100 parts per billion (ppb) [25]. The EPA took action to reduce the PCE levels in the daycare to below the NYS DOH air guideline. A subsequent evaluation by ATSDR indicated the risk for harmful effects from exposures to the children, staff, and parents involved with the daycare were reduced after actions were taken. However, the evaluation indicated that actions were needed to reduce the exposures to below the NYS DOH air guideline [25]. The daycare ceased operations and was closed on April 26, 2002 [24].

Nearby Use Concern: Kiddie Kampus Day Care—Wisconsin, 2008

Kiddie Kampus Day Care was located on the lower side of a two-level building. The upper level had several offices, stores, and a convenience store with a gas station. The daycare typically had 80-90 children and about 20 staff members during weekdays.

Gasoline odor was reported in the daycare after a gasoline leak and removal of gasoline from a containment crock located beneath the pump island. It was unclear how the vapors migrated into the indoor air.

Daycare staff and parents became concerned about the odor and the well-being of the children and contacted the Wisconsin Department of Children and Family Services. The Washington County Health Department, along with the Wisconsin Division of Public Health, visited the site. Some daycare staff members complained of headaches when they smelled the gasoline odor.

An investigation found elevated levels of gasoline vapors in the indoor air of the daycare. The highest measured benzene level in the daycare was 15 ppb, which is considered a health hazard for adults and children who have long-term exposure to the vapors. Xylene levels were not likely at a level harmful to adults, but it could not be determined if the exposures were a health hazard for children. It was also determined that if more gasoline was released from the pump island, the gasoline vapors could exceed the lower explosive limit, creating an extremely dangerous condition.

Investigators recommended that the day care relocate to another location until action was taken to ensure that gasoline vapors were not reaching the daycare [26]. Shortly after this incident, the daycare temporarily relocated to a nearby church. After mitigation actions and adjustments to the heating and air conditioning system, and after subsequent air testing consistently found safe levels of gasoline-related VOCs, the daycare returned to this location.

NATURALLY OCCURRING CONTAMINATION

Naturally occurring contamination comes from substances already in the environment, rather than from chemicals or other hazardous materials used or manufactured by humans. Radon is one of those naturally occurring contaminants. Radon seeps into homes from the rock under the building's foundation.

Human activities sometimes create conditions allowing exposure to a naturally occurring contaminant. For example, a mining operation might disturb naturally occurring contaminants in soil and rock. Rainwater might then wash contaminants such as lead out of exposed piles of soil and rock. The lead was naturally occurring but only became a problem when human activity disturbed it. Table 4.1 lists more examples of naturally occurring contamination.

Table 4.1 Naturally occurring contamination

Naturally occurring contaminant	Places contaminant is sometimes found	Reason for concern
Arsenic	**In water.** Some parts of the United States have high naturally occurring levels of inorganic arsenic.	Inorganic arsenic in large doses can cause a sore throat or irritated lungs. Swallowing very high levels of arsenic can result in death. Exposure to lower levels can cause nausea and vomiting, decreased production of red and white blood cells, abnormal heart rhythm, damage to blood vessels, and a sensation of "pins and needles" in hands and feet. Swallowing or breathing low levels of inorganic arsenic for a long time can cause a darkening of the skin and the appearance of small "corns" or "warts" on the palms, soles, and torso. Skin contact with inorganic arsenic can cause redness and swelling.
Asbestos	**In soil.** Natural weathering and human activities can disturb naturally occurring asbestos-bearing rock or soil and release mineral fibers into the air.	Asbestos mainly affects the lungs and the membrane that surrounds the lungs. Breathing high levels of asbestos fibers for a long time may result in scar-like tissue in the lungs and in the pleural membrane (lining) that surrounds the lung. This disease is called asbestosis and is usually found in workers exposed to asbestos, but not in the general public. People with asbestosis have difficulty breathing, often have a cough, and in severe cases, heart enlargement. Asbestosis is a serious disease and can eventually lead to disability and death.
Fluoride[7]	**In water.** High levels of fluoride occur naturally in some areas.	Fluoride in small amounts helps prevent tooth cavities. In adults, exposure to high levels of fluoride can result in denser bones. However, if exposure is high enough, these bones might be more fragile and brittle, and there could be a greater risk of the bone breaking.
Lead	**In water.** Most lead in water comes from the pipes or materials that help supply the water. Lead can sometimes be found naturally in groundwater.	Lead can affect almost every organ and system in the body. The main target for lead toxicity is the nervous system, both in adults and children. Long-term exposure of adults can result in decreased performance in some tests that measure functions of the nervous system. It can also cause weakness in fingers, wrists, or ankles. Lead exposure also causes small increases in blood pressure, particularly in middle-aged and older people and can cause anemia. Exposure to high lead levels can severely damage the brain and kidneys in adults or children and ultimately cause death. In pregnant women, high-levels of exposure to lead can cause miscarriage. High-level exposure in men can damage the organs responsible for sperm production.
Manganese	**In water.** Manganese is a mineral that is found naturally in rocks and soil. It can get into drinking water. It can also give water an odd taste, smell or color.	Manganese is an essential nutrient, and eating a small amount of it each day is important to stay healthy. The most common health problems in workers exposed to high levels of manganese involve the nervous system. These health effects include behavioral changes and other nervous system effects, such as slowed and clumsy movement. This combination of symptoms, when severe, is referred to as manganism. Other less severe nervous system effects, such as slowed hand movements, have affected some workers exposed to lower concentrations in the workplace. Studies in children have suggested that extremely high levels of manganese exposure can harm brain development, resulting in behavior changes and decreased ability to learn and remember.

[7] ATSDR's concern for fluoride exposures is not related to recommendations for fluoride use in toothpaste or water supplies to prevent tooth decay. Information on CDC's recommendations for fluoride and dental health are available at: https://www.cdc.gov/fluoridation/index.html.

Naturally occurring contaminant	Places contaminant is sometimes found	Reason for concern
Nitrates and nitrites	**In water.** Nitrates and nitrites come from the breakdown of nitrogen compounds in the soil. Flowing groundwater picks them up from the soil.	Nitrates and nitrites in large amounts are particularly threatening to infants (for example, when mixed in formula). Some people who ate food or drank fluids that contained unusually high levels of nitrite experienced methemoglobinemia (decreased ability of the blood to carry oxygen to tissues) and related symptoms, such as decreases in blood pressure, increased heart rate, headaches, abdominal cramps, and vomiting and some people died.
Radon	**In air.** Radon is a gas that is a natural product of the breakdown of uranium in the soil. Radon is most dangerous when inhaled. **In water.** Using household water containing radon contributes to elevated indoor radon levels.	Radon undergoes radioactive decay and can emit high-energy alpha particles, which are the main source of health concerns. The main isotope of health concern is radon-222 (222Rn). Many scientists believe that the alpha radiation dose from long-term exposure to high levels of radon emissions in the air increases the chance of getting lung cancer. Radon is less dangerous when consumed in water, but remains a risk to health.
Radionuclides	**In water.** Radionuclides are radioactive elements, such as uranium and radium that might be in groundwater.	Radionuclides can increase the risk for cancer. Swallowing water-soluble uranium compounds affects the kidneys at lower doses than does exposure to insoluble uranium compounds. Exposure to radium can affect the blood (anemia) and eyes (cataracts). It also can affect the teeth, causing an increase in broken teeth and cavities. Exposure to high levels of radium results in an increased incidence of bone, liver, and breast cancer.
Selenium	**In water.** Occasionally, drinking water contains high levels of selenium, usually in areas where high levels of selenium in soil contribute to the content of the water.	Selenium exposure at high levels can cause adverse health effects. Short-term oral exposure to high concentrations of selenium can cause nausea, vomiting, and diarrhea. Chronic oral exposure to high concentrations of selenium compounds can produce a disease called selenosis. The major signs of selenosis are hair loss, nail brittleness, and neurological abnormalities (such as numbness and other odd sensations in the hands and feet).
Uranium	**In water.** Uranium is naturally present in bedrock in many locations throughout the United States. When a drinking water well is drilled through bedrock containing uranium, the uranium can get into the drinking water.	Natural uranium and depleted uranium have the identical chemical effect on your body. Kidney damage has occurred in humans and animals after inhaling or swallowing uranium compounds. However, kidney damage has not been consistently found in soldiers who have had uranium metal fragments in their bodies for several years. Swallowing water-soluble uranium compounds will affect the kidneys at lower doses than will exposure to insoluble uranium compounds. Health effects of natural and depleted uranium result from chemical effects and not radiation.

Actions

This section lists some interventions that can be used to avoid placing ECE programs on or next to a contaminated site that might cause harmful exposures to children. These actions can help identify sites that could be a problem before an ECE program is in operation.

Many of these interventions could also be used to avoid situations in which potentially incompatible businesses open near an existing ECE program.

Table 4.2 Actions that can help identify sites with hazards from former and nearby uses to a site or naturally occurring contaminants

Action	Methods
Partnering with appropriate professionals	**Identify partners.** Identify partners and their abilities, roles, resources, and expertise that they can bring to the safe siting process. Focus on partners who can identify and assess hazards from past uses of a site, from sites that could pose an exposure concern if located near a child care facility, or from the location of naturally occurring contaminants. **Communicate. Establish and foster lines of communication between partners. Set up a process for partners to share data about sites and encourage open, honest dialogue.**
Finding potential problem sites	**Geographic information system (GIS) mapping of ECE programs and known waste sites.** Mapping through GIS indicates where ECE programs are located in relationship to known hazardous sites, potentially problematic or hazardous sites (such as active dry cleaners, gas stations, or those identified under RCRA[8]), or naturally occurring contamination. More information about GIS can be found in Chapter 6. **Property records search.** Searching public records (county records, deeds, and health or fire department records) for a site's past use can help identify past activities that might have left contamination at that location. Look for old maps or aerial photos of the area. Consider talking to people knowledgeable about the area to determine what might have been on the site in the past. **Documentation and property questionnaire.** Appendix A has an example of a property questionnaire that can be completed by child care providers. The questionnaire can be used as part of the child care licensing process. **Phase 1 and/or phase 2 — environmental site assessments.** If sites have had a phase 1 or phase 2 environmental site assessment they can provide useful information on contamination. Sometimes these site assessments are performed on commercial space before a bank will lend money for the purchase of the space. Asking if a phase 1 or phase 2 environmental site assessment has ever been performed for a site can provide useful information about contamination from past use. **Inspections.** Trained child care licensing inspectors can help identify sites that might not be suitable for a child care center because of past use or the proximity of potential hazards. Chapter 6 provides tools to help with training child care inspectors. **Windshield survey or site visit.** Doing a site visit to see what types of sites are neighboring a child care center site might help identify some sites that need further investigation. **Zoning and permitting.** Understanding local zoning and permitting may help identify sites that could have had a past use that left hazardous chemicals behind.

[8] The Resource Conservation and Recovery Act of 1976 (RCRA) regulates the management of solid waste (e.g., garbage), hazardous waste, and underground storage tanks holding petroleum products or certain chemicals. More information on RCRA can be found at https://www.epa.gov/rcra.

Action	Methods
Training, Education, Awareness Building	**Child care inspectors.** Because child care inspectors are already visiting child care centers, training them to look for clues related to potential contamination can be an effective way to find problematic sites. Training should focus on identifying potential issues with the former use of sites, building awareness on potential issues from adjacent site uses, and enhancing awareness of naturally occurring contamination. **Child care owners/operators.** Child care center owners and operators want to keep children safe. Educating them about past uses of a site, safe siting issues, and naturally occurring contaminants can help them identify potentially problematic locations and avoid placing a child care center there. **Local officials.** Local officials, such as boards of health, planning boards, zoning boards, city managers, and fire and safety officials, might have a role in permitting ECE programs in their communities. Educating local officials about potential hazards, vulnerabilities of children, and the importance of good siting decisions can help keep ECE programs from being placed on problematic sites.

Partners and Stakeholders

A variety of potential partners and stakeholders are available to offer support. Establish and foster lines of communication between them early to ensure a successful engagement. Partners can help identify sites that might have contamination and possibly provide the history of a site or nearby sites. Partners can also help answer questions about the fate and transport of types of contamination and what the potential is for children to be exposed to any chemical contaminants on site.

Creating awareness among partners is an important first step in ensuring safe places for ECEs. Some partners might not routinely be involved with ECE program siting and might never have considered their role in helping protect children from environmental exposures.

Partnerships can be informal or formal, with agreements between departments or agencies to provide assistance when necessary. Meetings between partners can be conducted at set intervals or as needed. Chapter 5 gives more information on building partnerships.

Table 4.3 provides a list of partners and the support they can help provide.

Table 4.3 Partners and stakeholders with support examples

Partner or stakeholder	Support the partner can provide or help provide
Accreditation organizations	• Offer accreditation to ECE programs that have had an environmental hazard assessment • Provide information to those seeking accreditation and can help encourage safe siting
ATSDR	• Provide technical assistance to partners • Determine what sampling is needed to determine if a site is safe for an ECE program, and help interpret sampling results • Explain exposure risks to others and assist with risk communication, if needed
Child care resource and referral agencies	• Providing parents with information regarding factors to consider when choosing an ECE program
Departments of agriculture	• Identify which sites might have been used in the past as agricultural land • Identify which sites are near agricultural land • Identify what types of agricultural pesticides and chemical might be used and when
Departments of environmental protection	• Identify known hazardous sites (RCRA and similar sites) • Evaluate what types of contamination might be present from a former use, nearby site, or naturally occurring • Evaluate possible sources of contamination at ECE programs that might affect the water quality of a private water source and provide the corresponding guidance on national, regional, and local contaminants • Identify known areas with naturally occurring contamination; may have records or files for investigation • Provide information on how to sample for certain contamination and help develop sampling plans • Provide potential information on past sampling (if any) of a specific site
Departments of emergency services	• Provide information on past use of some sites. • Provide potential site locations on hazardous materials inspections from local emergency services departments
Departments of public health	• Evaluate what types of contamination might be present from a former use or a nearby site, or which may be naturally occurring • Identify what environmental sampling, if any, is needed to determine if a site is safe for a child care center, and interpret sampling results • Help explain exposure risks to others and assist with risk communication, if needed • Provide technical assistance to ECEs regarding understanding water quality reports, water testing parameters, private well testing, data interpretation, and water treatment options • Provide best management practices to ECE programs on proper cleaning practices for water fountains and hot water tanks

Partner or stakeholder	Support the partner can provide or help provide
ECE licensing or lead agencies, e.g., CCDF lead agencies	• Provide information on process for ECE programs to be licensed • Provide potential geocoded data on where ECE programs are located • Assist with determining which policies or regulations help to keep ECE programs from being located near an incompatible site • Provide guidance on state or local drinking water quality regulations that affect ECE programs • Identify potentially problematic sites
ECE providers or local organizations	• Help ensure that their programs are safely sited
Historic societies	• Provide information on past use of some sites or sections of a town or city, which can help to identify what chemical contaminants need to be considered
Law enforcement	• Identify places where former illegal activity (dumping, clandestine drug labs) has taken place
Local medical professionals and pediatric environmental health specialty units (PEHSUs)	• Raise awareness and understanding of how children are susceptible to environmental contaminants • Help raise awareness of the need for safe siting • Help with risk communication
Local planning and zoning boards	• Identify sites that might have been designated or used as manufacturing or industrial sites • Identify sites near an ECE site that should be assessed • Ensure appropriate siting of new ECE programs
Local water districts	• Provide information on national, regional, and local drinking water contaminants
National environmental public health tracking	• Provide potential resources for GIS with location data for contaminated sites • Identify potential hazards in a specific location based on shared data from the national, state, and municipal level
Professional organizations like National Head Start Association or National Association for the Education of Young Children	• Raising awareness and educating providers
Town and city planners	• Identify past use of sites and existing use of nearby sites • Help access local records • Ensure any plans they receive for new ECE programs have had environmental exposures considered
University agricultural extension offices	• Provide guidance on installation and maintenance of private water systems, drinking water quality, and water treatment options
U.S. Geological Survey	• Help identify areas across the United States that have naturally occurring contamination

IMPLEMENTATION APPROACHES

Policy Changes

In many cases, policy changes can be used to safeguard ECE programs from being placed on contaminated sites. Policy changes are revisions to procedures or processes that affect ECE siting in a particular jurisdiction. They are often simpler to implement because they do not require regulatory action or new legislation. For example, changes might be made to ECE program licensing procedures to help ensure that ECE programs do not operate on contaminated sites. Many changes presented in Table 4.4 could be made at the agency or department level and might not require additional resources.

Table 4.4. Sample policy changes

Policy	Expected outcome
Create a formal procedure for potentially problematic sites to be referred for follow-up to an agency that can assess the site.	The appropriate agency can help follow up and further investigate any site that might not be appropriate for a child care center.
Formalize procedures for sharing site data among partners.	Sharing information can help partners more quickly identify potentially problematic sites.
Train ECE program inspectors to look for evidence of past uses of sites that might be incompatible with a child care center. Have inspectors refer suspect sites to an agency that can assess the site.[9]	When inspectors know what to look for and have resources for referrals, they can help identify sites that might need additional investigation to ensure the site is appropriate for an ECE program.
Before licensing, ensure all ECE program sites are checked against lists of known local, state, or national hazardous sites. Explore zoning changes in local communities to try to keep ECE programs off of sites with past contamination.	Checking known hazardous sites can help ensure ECE programs are not placed on those sites.
Incorporate past site use information into local permitting process for new ECE program.	Asking about past site use during the local permitting process can identify potential problem sites before a new ECE program receives a local permit.
Ensure that businesses that may pose a hazard do not begin operation near an ECE program that is already in operation.	Many businesses may not be compatible with an ECE program near it. Ensuring that businesses that pose a potential hazard do not open adjacent to existing ECE programs would help protect the children and staff in those programs.
Ensure that naturally occurring contamination common to the region is ruled out as a contaminant of concern at ECE program sites.	If naturally occurring contamination in specific locations is known, inspectors and caretakers can focus on identifying these common contaminants and resolving them.

[9] The Child Care and Development Block Grant Act of 2014 requires the "Lead Agency" to ensure that individuals who are hired as licensing inspectors are qualified to inspect those child care providers and facilities and have training in related health and safety requirements

Regulatory Program Changes

In jurisdictions where the ECE program standards and requirements are established by administrative regulations, these regulations may need to be changed to implement safe siting principles. In some cases, regulatory changes require state legislative action. Others are managed by a state or local administrative agency following applicable state or local procedures.

Jurisdictions seeking to implement ECE siting standards might first review current regulations to determine if those already have language that gives the licensing agency the authority to administer and enforce safer siting for ECE programs. Such language could include provisions that cover general hazards, which specifically mentions where ECE programs can be located, or that specify what a site can or cannot have on or next to it. ATSDR encourages the use of *Caring for our Children Basics* as a resource to help states work through the current standards and see how they compare [3].

Many states have some general site or location criteria language. Examples of this type of language are "in an area which offers minimum hazards to health, safety, and welfare of the children" and "be located in a relatively noise-free and pollution-free environment" [19]. A regulatory review could also be used to determine if such general site criteria have ever been used to address environmental contaminants and to understand how compliance with regulations is demonstrated during the application and review process. Jurisdictions that undertake an ECE regulatory review should consider coordinating closely with their legal counsel.

Internal regulatory reviews can also identify gaps in authorities and procedures. Collaboration with stakeholders to review existing regulations can also help identify gaps. Once gaps are identified, continued collaboration can help craft new language to become the basis for new regulations. Collaboration with key stakeholders, both inside and outside the agency, helps ensure that any newly proposed regulations meet the needs of those involved in the ECE siting process and do not create any unintended consequences. By undertaking a systematic regulatory review and making regulatory changes to ECE program licensing requirements, agencies that provide ECE program licenses could have a tool in place to help ensure ECE programs are not put on contaminated sites.

ACCESS TO SAFE DRINKING WATER

Clean, fresh drinking water is essential for human health [28]. Children's growing bodies require water; moreover, children drink more water per kilogram of body weight than do adults [29], making them more susceptible to the effects of contaminants in drinking water.

In addition to the healthful benefits of water, federal law requires that ECE programs participating in the Child and Adult Care Food Program make water available to children [30]. Specifically, ECE programs are required to make water available to children throughout the day, including at meal times and when requested by a child.[10]

This section describes how to identify potential contaminants in drinking water and protect children and ECE program staff from these contaminants.

[10] Please note that Head Start requires that their ECE programs make safe drinking water available to children under their care.

Sources of Water Contamination

Contaminants can get into drinking water from a variety of sources, activities, or problems, including the following [21]:

- Naturally occurring elements and minerals, such as arsenic, radon, and uranium.
- Water pipes and old plumbing.
- Agricultural use of fertilizers or pesticides, livestock grazing, or concentrated animal feeding operations.
- Manufacturing or industrial processes.
- Sewer overflows.
- Malfunctioning wastewater treatment systems, such as nearby septic systems.

Contaminants in Drinking Water

Many substances can contaminate drinking water. Some contaminants, such as lead from old plumbing fixtures, are common across the country; others are specific to a region or small local area. Which specific contaminants are in a drinking water source—if any—depend on the natural environment, the human uses that surround it, the local or regional water system, and the plumbing fixtures used in a specific building. Table 4.5 lists some common contaminants found in drinking water.

Different regions of the country have different rock and soil composition. Soil composition affects the types of elements and minerals that might be in the water. For example, in the Northeast and the Southwest, naturally occurring elements that might get into water include arsenic, radon, and uranium.

Locally, human activities such as agriculture, manufacturing, or industrial processes, and sewer or wastewater treatment can also contribute to water contamination. For example, the chemical TCE is used for cleaning metal parts and also for dry-cleaning clothes. When TCE is spilled, it can soak into the ground and get into groundwater supplies.

In office buildings and homes, contaminants such as lead or copper could get into drinking water by leaching from plumbing materials and fixtures as water moves through the water pipes. Even if the source drinking water meets federal and state standards for lead or copper, a building could have elevated lead or copper levels caused by its plumbing materials and water use patterns. Because lead or copper concentrations can change as water moves through the distribution system, the best way to know if a building might have elevated levels of lead or copper in its drinking water is by testing the water in the building. Testing makes it possible to evaluate the plumbing and helps target remediation.

State or local health departments can provide information on how to test your drinking water for common, regional, and local contaminants.

Table 4.5. Some common contaminants in drinking water

Contaminant	How it enters water	Health effect	Where found
Copper	Copper has been used in household plumbing. Copper is also found in fixtures, faucets, and fittings made of brass. Where drinking water is slightly acidic, the copper might dissolve out of the fixtures and fittings more readily and get into the drinking water.	Some amount of copper is essential to good health, but drinking too much copper can cause nausea, vomiting, and diarrhea [31].	Across the United States, wherever it was used in pipes and plumbing fixtures.
Lead	Has been used in making water pipes that bring water from the public source to homes or businesses and that carry water within homes or businesses. Homes built before 1986 are more likely to have plumbing with lead.	Lead is known to damage the brains of children who drink it. Lead can cause behavior change and reduce a child's capacity for learning. These effects can last a lifetime [32].	Across the United States, wherever it was used in plumbing pipes and fixtures.
Naturally occurring contaminants (arsenic, uranium, radon, etc.)	From natural processes such as groundwater dissolving minerals. Naturally occurring contaminants can be made more accessible by human activities such as mining.	Various possible health effects.	Occurs regionally across the United States.
Nitrates	From animal and human waste that comes from agricultural run-off, sewage, and leaking septic tanks.	Nitrates can cause serious health effects and even death in infants age six months and younger.	Across the United States in agricultural areas and areas where homes use septic tanks.
Other chemicals (pesticides, TCE, VOCs, etc.)	From agriculture, manufacturing, and industrial processes.	Various possible health effects.	Occurs locally, depending on the current or past use of the site and nearby sites.
Pathogens Note: Pathogens are not chemical contaminants, but because their health effects can be swift and serious, they are included in the table for completeness.	Pathogens include bacteria (such as Escherichia coli), single-celled organisms (such as Cryptosporidium [33] and Giardia [34]), and viruses. Pathogens can get into your water supply from sewer overflows or malfunctioning wastewater treatment or septic systems.	Some pathogens can cause stomach upset and diarrhea. Water-borne pathogens, such as Legionella [35], can cause pneumonia, and echovirus and Coxsackie B can cause inflammation in body organs [36].	Across the United States.
Per- and polyfluoroalkyl substances (PFAS)	A group of compounds resistant to heat, oil and water. These chemicals were used in many manufacturing products and firefighting foam.	Information is still emerging on how these contaminants affect human health. They might harm the liver or kidneys.	As these chemicals are being more readily tested for in water, they are being found across the United States in public and private water supplies.

Actions

Actions to improve drinking water quality depend on where the water comes from. To monitor or improve the quality of the water in an ECE program, first know where it comes from. This section describes different ways water is provided and what steps an ECE program operator can take to monitor and improve the quality of the water they serve in their facility (see Table 4.6 for categories of water systems that serve ECE programs).

Some contaminants are unique to specific regions or locations within the United States. Check with local or state drinking water regulator or water board to learn which water contaminants are common in your area.

Table 4.6. Categories of water systems that serve ECE programs

Category 1 – Community water system

(This category is considered a public water system.)

Characteristics	Function
Definition	• Delivers water to 15 or more service connections OR at least 25 residents are served by the system year-round. • The system could be publicly owned and operated, like a city, town, or "municipal" water system. • The system could be privately owned and operated, like a water system for a specific subdivision or commercial building.
Some ECE examples	• An ECE program that receives a bill for their water use. • An ECE program in a large commercial building (for example, within an office building) that is on a "municipal" water system might not pay a water bill separately from their rent.
Oversight	• Water provider must maintain EPA water quality standards and report to the public annually as a "Consumer Confidence Report."
Actions	• Review municipal water system's annual "Consumer Confidence Report" at http://cfpub.epa.gov/safewater/ccr/index.cfm. • Talk with local or state health department, or local or state environmental department if help is needed understanding or interpreting the Consumer Confidence Report. • Review the EPA booklet "Drinking Water Best Management Practices For Schools and Child Care Facilities Served by Municipal Water Systems" [42] for suggestions regarding the following topics: ▪ Cleaning bacteria from drinking water fountains and hot water tanks ▪ Routine measures for reducing lead exposure ▪ Responding to elevated lead levels ▪ Testing for copper pipes • Review the EPA booklet "*3Ts for Reducing Lead in Drinking Water in Schools: Revised Technical Guidance*"[43].

Table 4.6. Categories of water systems that serve ECE programs (continued)

Category 2 – Non-transient, non-community water system

(This category is considered a public water system.)

Characteristics	Function
Definition	• Delivers water to at least 25 of the same non-resident persons six months or more per year. • [Although water is available all the time, people are only using the water during "business hours."]
Some ECE examples	• An ECE program with 25 or more staff and children that operates its own water system. • An ECE program located in a large commercial building that maintains its own water source.
Oversight	• Water system owner is responsible for water quality; federal and state drinking water standards and operational requirements apply.
Actions	• Review municipal water system's annual "Consumer Confidence Report." Get it, or get a local contact information from the EPA at: http://cfpub.epa.gov/safewater/ccr/index.cfm. • Talk with local or state health department or local or state environmental department if help is needed understanding or interpreting the Consumer Confidence Report. • Review the EPA booklet "Drinking Water Best Management Practices For Schools and Child Care Facilities Served by Municipal Water Systems [42]" for suggestions regarding the following topics: ▪ Cleaning bacteria from drinking water fountains and hot water tanks ▪ Routine measures for reducing lead exposure ▪ Responding to elevated lead levels ▪ Testing for copper pipes • Review the EPA booklet "*3Ts for Reducing Lead in Drinking Water in Schools: Revised Technical Guidance*" [43].

Table 4.6. Categories of water systems that serve ECE programs (continued)

Category 3 – Private water system

(This category is considered a public water system.)

Characteristics	Function
Definition	• Delivers water to less than 25 of the same people per day. • [Sometimes called "private well," but water source could be surface water or another source.]
Some ECE examples	• An ECE program with fewer than 25 staff and children that operates its own water system.
Oversight	• Water system owner is responsible for water quality; state or local regulations may apply. • Check state ECE licensing regulations for additional requirements.
Actions	• Work with local health department or environmental department to learn which regulations apply. • Ask local health department or environmental department to help identify national, regional, and local contaminants. • Work with local agencies to develop and implement a water sampling and treatment plan for your private water system. You may find support at the local health department, environmental department, and in some locations, a local university agriculture extension office. • Retest your water for specific contaminants at regular intervals recommended by your local agency. • Maintain wells as recommended by the well provider. • Maintain water treatment system as recommended by the manufacturer. • Review the EPA booklet "Drinking Water Best Management Practices for Schools and Child Care Facilities with their Own Drinking Water Source [37]" for suggestions regarding the following topics: ▪ Cleaning bacteria from drinking water fountains and hot water tanks ▪ Routine measures for reducing lead exposure from lead plumbing ▪ Responding to elevated lead levels ▪ Testing for copper pipes • Review the EPA booklet "3Ts for Reducing Lead in Drinking Water in Schools: Revised Technical Guidance [43]" • EPA recommends all private residential wells be tested at least once a year for nitrates and total coliform. Contact your state drinking water program for recommendations for water quality parameters.

Notes on Operating a Private Water System

ECE programs that operate their own water system and have fewer than 25 staff members and children are categorized as having a "private water system." Many of these ECE programs use private wells as their water source, and others might use a spring, surface water, or another water source. A private water system owner must maintain water quality, but they are not subject to federal regulations. Water quality testing might be required by state or local regulations, including ECE program licensing regulations. ECE programs using a private water system can work closely with the local or state health department or environmental department to regularly test water quality, treat water as needed to ensure it meets appropriate standards or guidelines, and maintain their water source. Routine water testing and treatment tasks are in addition to the best management practices for schools and ECE programs.

Water testing requirements for ECE program licensing often are not as comprehensive as those recommended for private residential wells. ECE programs should not assume that satisfying the water testing requirements specified in ECE program licensing regulations is enough to ensure that the water supply is safe for children in their care and staff. Consult with the state and local health departments to learn about additional testing recommendations applicable to the ECE program.

Finally, routine water quality testing might not include local or regional contaminants that could be present at a site. Consult with state and local health departments or environmental departments to learn what additional contaminants might need to be added to routine water testing if an ECE program is located

- On a site that formerly used or stored chemicals.
- Near a former or current contamination site.
- In an area with known naturally occurring contamination.

Partners and Stakeholders

ECE stakeholders have many opportunities to modify water systems and user practices to safeguard health. For example, they can improve the monitoring and testing of private water systems and implement water use practices to minimize lead exposure in buildings with older pipes. See Table 4.7 for some suggestions.

Table 4.7. Partners and stakeholders who can support access to safe drinking water in ECE programs

Partner or stakeholder	Support can provide
Custodians, maintenance persons	• Proper maintenance, monitoring, and cleaning of the ECE program's water pipes, hot water tanks, and drinking fountains
Departments of environmental protection	• Evaluate possible sources of contamination on the site or a nearby site that might affect the water quality of private water sources • Give guidance on national, regional, and local contaminants that might be in the water • Provide recommendations on water quality testing parameters
ECE program licensing agencies	• Might be able to provide guidance on state or local drinking water quality regulations that affect ECE programs
Kitchen and food service professionals	• Use of proper procedures to minimize lead contamination of drinking water used for food preparation when an ECE program is known to have lead-based plumbing
Local water districts	• Might be able to help provide information on national, regional, and local drinking water contaminants
State, territorial, local and tribal departments of public health	• Help interpret water quality reports • Give guidance on water testing parameters, private well testing, data interpretation, and water treatment options. Provide best management practices to reduce contamination from pipes. Train staff on proper cleaning practices for water fountains and hot water tanks
University agricultural extension offices	• Give guidance on installation and maintenance of private water systems, drinking water quality, and water treatment options

Policy and Regulatory Changes

The water regulations that apply to ECE programs vary with the drinking water system (see Table 4.6) and the state and locality of the centers. Collaboration with stakeholders can help identify gaps in regulations or policies that could be addressed to help protect children. To determine if new policies or regulations are needed to help ensure safe drinking water for children, first review the current regulations and policies in place within the state for water quality at ECE programs. This section lists several resources to help navigate policy and implement good practices.

Federal policy and regulations

EPA maintains regulations and oversight of public water systems through the Safe Drinking Water Act. The National Primary Drinking Water Regulations provide state water quality standards and reporting through the Consumer Confidence Reporting system. Information on the standards is available at https://www.epa.gov/dwstandardsregulations.

State policy and regulations

The Environmental Law Institute's 2015 booklet, *Drinking Water Quality in Child Care Facilities: A Review of State Policy*, describes how existing state laws and regulations across the United States address this issue in the ECE context. The document is available at http://www.eli.org/research-report/drinking-water-quality-child-care-facilities-review-state-policy.

Best practices guidance

These EPA guidance booklets are also useful resources for understanding federal policy and best practices as they apply to ECE programs:

- *Drinking Water Best Management Practices for Schools and Child Care Facilities Served by Municipal Water Systems*, available at http://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100HGM8.txt.
- *Drinking Water Best Management Practices for Schools and Child Care Facilities with Their Own Drinking Water Source*, available at http://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100GOT8.txt.
- *3Ts for Reducing Lead in Drinking Water in Schools: Revised Technical Guidance,* available at https://www.epa.gov/dwreginfo/reducing-lead-drinking-water-schools-revised-technical-guidance.

Some universities and non-profit organizations have also released guidance materials and best practices on maintaining private wells and promoting water as a healthier beverage in ECE programs:

- The Private Well Class, funded by EPA, offers a free 10-lesson course on well care, and ongoing webinars on technical topics to help well owners maintain their well and comply with regulations. The document is available at http://privatewellclass.org/.
- Several federal public health initiatives to reduce childhood obesity and increase childhood physical activity promote water as a healthier beverage for children in child care centers. More information and guidance is available at
  - https://healthykidshealthyfuture.org/5-healthy-goals/provide-healthy-beverages/resources/ and
  - http://www.cdc.gov/obesity/downloads/early-childhood-drinking-water-toolkit-final-508reduced.pdf.

Other policy resources

The National Resource Center for Health and Safety in Child Care and Early Education provides voluntary standards for water supply and plumbing and lists additional references in its *National Health and Safety Performance Standards, Guidelines for Early Care and Education Programs, 3rd Edition*, available at http://cfoc.nrckids.org/StandardView/5.2.6.2.

In its policy statement titled "*Drinking Water from Private Wells and Risks to Children,"* the American Academy of Pediatrics gives a detailed list of "conditions or activities nearby requiring testing" (see "Flowchart for Testing Well Water" on page six of the publication). The document is available at http://pediatrics.aappublications.org/content/123/6/1599.full.pdf.

Case Study

Access to Drinking Water: Connecticut's Department of Public Health – Connecticut, 2012

When a child care center using well water was licensed and opened in 2012 on the site of a former gas station, the Connecticut Department of Public Health (CTDPH) knew there was work to be done to protect children's health. CTDPH learned that contaminated soil and underground gasoline storage tanks had been removed from the property during past clean-up activities. Additionally, CTDPH was aware that groundwater throughout Connecticut contains higher amounts of naturally occurring arsenic and uranium than in other regions of the United States.

Because the number of children and staff at the center did not meet the threshold for regulation as a public water system (see Table 4.6), CTDPH advised the child care operator to test the well water for arsenic, uranium, and volatile chemicals that could come from gasoline.

Testing showed no gasoline constituents or uranium, but did identify levels of arsenic above Connecticut's action level for private wells.

On the basis of this result, CTDPH recommended that the child care operator either use bottled water for cooking, drinking, and food preparation or install treatment to remove arsenic to acceptable levels.

Had CTDPH not advised the child care operator, the elevated arsenic would not have been discovered because arsenic testing is not included in well water testing parameters required for child care licensing.

Additionally, CTDPH was able to inform the state child care licensing program about the history of elevated naturally occurring arsenic in wells in the area in which the daycare was located.

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CHAPTER 5: HOW TO BUILD A PROGRAM – MODELS FOR A SAFE ECE SITING PROGRAM

GENERIC CONCEPTUAL MODEL

This chapter presents models and approaches for state, county, or local entities to consider when creating a program for safe ECE program siting. The models and approaches do not have to be adopted in full, but may be implemented in parts or stages. Each state or locality will have different circumstances that dictate which approaches and sequencing will work best.

Methods to build safe ECE program siting partnerships

1. Identify partners
2. Learn about your state's ECE program licensing and inspection programs
3. Understand how local land use and permitting decisions are made
4. Learn about your state's programs for identifying, evaluating, and remediating hazardous waste sites

Key components to consider when building a program for ECE siting include your partners, state licensing and inspection programs, land use and permitting requirements, and hazardous waste sites (see Box). Each component is discussed in the sections below. Program components do not need to be implemented at the same time or in the sequence discussed here.

IDENTIFYING PARTNERS AND BUILDING PARTNERSHIPS

Building an effective, safe ECE siting program is most successful when it is a collaborative process. The effort can start with partnership building among governmental programs in your state responsible for the following:

1. ECE program regulation (licensing and inspection).
2. Hazardous waste site identification, assessment, and cleanup.
3. Local land use and permitting decisions.

For a program to work efficiently and effectively, a single unit should assume overall responsibility for initiating and then coordinating the program. An ideal group for this role is a programmatic unit within a state health department with expertise in assessing exposures and health risks from hazardous substances in the environment. In states with APPLETREE cooperative agreement funding,[11] the unit performing APPLETREE work is ideally suited to coordinate a safe ECE siting program.

The first steps in partnership building are to identify the primary partner groups with whom you will need to collaborate and familiarize yourself with their roles and responsibilities (see Chapter 4, Table 4.3, for descriptions of potential partners or stakeholders). A good understanding of how licensing, inspection, and regulation of ECE programs occur in your state is important. This includes learning about how local planning and zoning agencies make land use and permitting decisions for ECE programs. Also familiarize yourself with your state's regulatory programs for identifying, assessing, and remediating hazardous waste sites. To help you gather information, Chapter 6 includes a list of questions to consider asking your partners and partner groups. Understanding the roles and responsibilities of your partner groups will inform you about what program model might be best suited for your state. It will alert you to potential obstacles, resource constraints, and data gaps that might influence how you set up your safe ECE siting program. It also might help you decide whether a regulatory, non-regulatory, or hybrid program will work best in your state (see chapter 4 for a definition of these programs).

[11] The Agency for Toxic Substances and Disease Registry (ATSDR) Partnership to Promote Localized Efforts to Reduce Environmental Exposures (APPLETREE) cooperative agreement program supports state efforts to evaluate and respond to environmental public health issues involving human exposure to hazardous substances in the environment.

By communicating up front with your partner groups, you will learn about ECE program siting policies and protocols already in place in your state. The Environmental Law Institute review of state environmental policies for ECE programs provides a good compilation of ECE program location criteria that might already be in place in your state [19]. It is useful for you to learn if your state already has ECE program siting criteria, how the criteria are implemented, and how compliance with siting policies or regulations is enforced. Understanding your state's policies and regulations can help you identify strengths and weaknesses in existing procedures and where changes can be made to improve the effectiveness of existing programs.

Finding Potentially Problematic ECE Programs and Locations

An important component of a safe ECE siting program is having an established process for finding potential problems. To do so, every program needs to have a way of finding

- ECE programs sited on land or in buildings where the presence of hazardous chemicals could result in harmful exposures.
- ECE programs located next to facilities using hazardous chemicals that could affect the ECE program.
- Locations that might not be safe for siting a new ECE program because of a past use or because of nearby facilities.

Appendix E describes types of former uses or nearby uses that could have left residual contamination. Chapter 4 also has examples of businesses that might pose exposure concerns if operating next to an ECE program.

A safe ECE siting program can be designed using a single approach or multiple approaches for finding problematic ECE programs and locations. Having more than one procedure for finding problem ECE programs and sites reduces the possibility that problems will be missed. Several general approaches can be used to find problem ECE programs and locations. Some approaches are resource intensive, and some require little to no additional resources.

The approach(es) you select will be driven by existing regulations, policies, and procedures and your partner groups. Your program will also be shaped by whether it will place burdens on government entities, on ECE program operators, or both. A program can be established using

- Approaches that rely on regulations to enforce procedures (regulatory model).
- Approaches that can be implemented without the need for regulations (non-regulatory model).
- A combination of regulatory and non-regulatory approaches (hybrid model).

No one type of program is preferred. Every state is different and what works in one state might not work well in another state. Table 5.1 summarizes approaches that could be used to find problem ECE programs and locations. The table is not intended to be exhaustive. Other approaches also could be successful in your state. For each approach, Table 5.1 summarizes how the approach could be implemented and provides advantages and drawbacks for the approach. Each approach is described in more detail after the table.

Table 5.1. Approaches for finding potentially problematic ECE programs and locations for future ECE

Approach	Implementation	Advantages	Drawbacks
ECE program certification	• ECE program operator documents that building, property and surrounding environment have no environmental hazards of concern	• Potentially lower burden on government agencies	• Higher burden on ECE program operators • Covers only new siting, unless retroactively implemented • Potentially unreliable without government auditing or compliance process • Audit or compliance process might have high resource needs for government
	• Government entity documents that building, property and surrounding environment have no environmental hazards of concern	• Low burden on ECE program operators	• High government resource needs • Covers only new siting, unless retroactively implemented
Geographic based	• Compare addresses to find co-located ECE program and hazardous waste sites or potentially incompatible businesses/land uses	• Low resource needs (provided hazardous waste sites lists exist) • Low resource needs if implemented only for new ECE programs and not existing ECE programs • Low burden on ECE program operators	• Potentially miss a nearby problem businesses or land uses if not on the same street as the ECE program • Potentially resource intensive to include all current ECE programs • Comprehensive list of nearby hazardous waste sites may not exist • Complete list of incompatible businesses might not exist
	• GIS-based comparison to find ECE program within a specified geographic radius of a hazardous waste site/ potentially incompatible business/land use	• Low resource needs (provided GIS-based data are available) • Covers existing facilities and new siting • More comprehensive than street address match • Allows for repeat analysis on regular basis with little resources • Low burden on ECE program operators	• High resource needs if GIS-based data must be generated • Potentially high resource needs to keep GIS-based data current

Approach	Implementation	Advantages	Drawbacks
Inspections	• Use existing ECE program inspection process to look for ECE program siting issues and incompatible nearby uses	• Low resource needs • Covers existing facilities and new siting • Low burden on ECE program operators • Takes advantage of inspections already happening	• Limitations on control of inspection frequency and process • Requires regular inspector training
	• Create new inspection process	• Inspection process can be designed specifically for siting and location issues • Covers existing facilities and new siting • Low burden on ECE program operators	• Potentially high resource needs • Requires regular inspector training
Local zoning/ Permitting	• Local planning and zoning boards identify issues during permitting process for ECE programs and potentially incompatible businesses	• Low resource needs for local boards to implement • Low burden on ECE program operators	• Potentially high resources needed to contact and train local permitting boards • Covers only new siting
Siting Criteria	• Develop location criteria for siting new ECE programs	• Low burden on ECE program operators	• Potentially high resource needs to develop criteria and determine compliance • Covers only new siting

Inspection

The existing inspection process can be used to identify ECE programs with potential problems. While on regularly scheduled inspections, ECE program inspectors could

- Look for clues that the ECE program might be located on land or in a building that could be contaminated from a prior use.
- Look for facilities or businesses using hazardous chemicals that are operating next to an ECE program.
- Catch potential problems before the ECE program is operational if the state requires an inspection before an ECE program opens (most states require this).

Using an existing inspection process makes this approach possible to implement with little to no additional resources.

- Inspectors can adapt the existing inspection process.
- Siting criteria can readily be amended to existing inspection process.
- Hiring new inspectors is not required.
- Trained inspectors can educate current inspectors with new siting criteria.

How can ECE operators/directors improve ECE siting?

- Provide your state/local licensing agency with all environmental reports for your property.
- Ask your state/local public health agency whether there are any environmental conditions at your property that could pose a risk to children.
- If you have a well for drinking water, consult your local or state health departments for what contaminants to test.
- Observe land uses and businesses next to your ECE program and ask your state/local public health agency whether the nearby land uses could create exposures of concern at your facility.
- Learn what your land and buildings were used for in the past. Ask whether any of the past uses could have caused environmental problems.

A potential drawback to this approach is that the ECE safe siting program would not necessarily have control over when and how frequently inspections occur.

If your state has an inspection process for specific types of facilities using hazardous chemicals,[12] inspectors (while on their regularly scheduled inspections) could be trained to look for nearby ECE programs that could be at risk. This option could be implemented with few or no additional resources. However, a major drawback is that for many businesses of potential concern, states probably do not have existing inspection procedures.

An alternative to using the state's existing ECE program inspection process is to create a new inspection process focused specifically on ECE program siting issues. ECE program siting inspectors could inspect new programs before their opening. They also could periodically inspect existing ECE programs to identify potential problems with the land, ECE building, or nearby facilities. This alternative would be much more resource intensive to implement than using an existing inspection process. However, one advantage is that the ECE siting program would have full control over when and how frequently inspections occur.

[12] For example, in some states, local health departments regularly inspect nail salons and hair salons.

Geographic Analysis-Based

This approach involves comparing lists or databases of ECE programs with lists or databases of facilities or locations where hazardous chemicals might be present. Facilities of concern might include hazardous waste sites, landfills, dry cleaners, and auto body shops. Areas of concern might include those with plumes of groundwater contamination, high radon, or arsenic or uranium in groundwater. Comparisons of ECE program databases with other databases of potential problem locations can

- Use geographic information system (GIS) mapping to find ECE programs within a specified geographic distance (for example, within 1/8 mile) from a source of hazardous chemicals.
- Identify ECE programs on or near locations having hazardous chemicals.
- Screen locations being considered for a new ECE programs.

To fully use this approach, a state must have access to databases of geocoded locations. To be fully effective, geocoded data must be updated regularly and database comparisons must be done regularly. For many states, geocoded data are not available. It can be resource intensive to create geocoded databases. Additionally, lists of locations where hazardous chemicals are present might not be comprehensive. For example, problem locations, such as old orchards or cropland, might not be included on any hazardous waste sites lists. If the state is interested in pursuing this approach, it is important to identify the agencies with the databases or lists you need. This may include state, local, EPA, or other federal agency-managed data systems. Some data might be easily accessible. For access to other types of information, memoranda of understanding or data sharing protocols might be needed.

For non-geocoded lists of addresses, an option is to manually cross-check ECE program addresses with addresses of sites where hazardous chemicals might be present. You can use the manual crosscheck procedure to identify an ECE program on the same street address as a potential problem location. This crosscheck can be done for existing ECE programs and for an address being considered for a new program. A major drawback to this approach is that using a street address match might miss nearby locations on other streets. Manual crosschecks also take more time to conduct than electronic database comparisons.

The database comparison approach to finding problem ECE programs and locations often can be done with existing resources.

Local Zoning/Permitting

In many states, local planning and zoning boards make decisions about whether a property is acceptable for use as an ECE program. This often happens through the local permitting process. That means that local planning/zoning/permitting entities can be extremely important partners in a safe ECE siting program. One approach for finding problem ECE programs is to enlist the help of these local entities.

Local zoning or permitting boards can be educated to ask questions about nearby facilities and former uses of a property *before* granting a permit for new ECE program. They can also ask about the presence of nearby ECE programs when considering a permit for a new facility such as a nail salon or auto body shop. This approach can be done with few to no additional resources. Providing a protocol for local staff to follow, including questions they should ask, may be helpful.

One drawback of this approach is that it focuses on new ECE programs, not existing ones. Another drawback is that it can be resource intensive to provide training or outreach to a potentially large universe of local zoning/permitting officials spread throughout the state.

Siting Criteria

Establishing location or siting criteria for new ECE programs is another approach that can be used to ensure that ECE programs are not placed on property, in buildings, or next to facilities where there are hazardous chemicals. Some states have ECE regulations that include siting criteria to address proximity of an ECE program to potential environmental hazards [19]. However, most of the criteria used by states appear to be very general. For example, Oklahoma ECE programs must be located "in an area which offers minimum hazards to the health, safety, and welfare of the children" [19]. Before relying on this type of approach, a state may want to carefully consider who will be responsible for applying the criteria and how compliance will be shown. If the criteria are general, implementation guidance might need to be developed to describe how the criteria should be applied and what constitutes an "environmentally safe site" or a "minimum hazard area."

ECE Program Certification

In this approach, the burden of finding potentially problematic ECE programs and unsuitable locations is placed more on the operator or owner than on a government entity. The operator provides information to a licensing or other government agency regarding the suitability of a location for an ECE program. This can be done in various ways. As part of the ECE program licensing process, an operator can complete a questionnaire about past property uses or paperwork to certify that the property is not affected by hazardous chemicals and is not located next to a facility where hazardous chemicals are used. A wide range of documentation can be used for such certifications and submittals. In New Jersey (whose regulatory program is discussed in detail in Chapter 5.3), a license applicant must hire a consultant to assess the building and property to document that it is suitable for child care use. In contrast, New York requires child care centers to self-certify that the center, property, and surrounding environment do not contain environmental hazards. Connecticut asks child care license applicants to complete a questionnaire about the past use of the building and property. Connecticut has no regulatory requirements mandating that the questionnaire be completed, and the level of due diligence needed to complete the questionnaire is left to the discretion of the child care center license applicant.

Each of these operator submittal and certification options has benefits and tradeoffs. Requiring that every program hire a consultant to do an environmental assessment before receiving a license could be an onerous burden on operators. However, the information obtained might be more reliable than self-certification, for which operators might put differing amounts of effort into the process. Using submittals or certifications from operators could be made voluntary or could be required using regulations. The level of resources needed to carry out this general approach depends on the level of review or audit of the submittals and certifications. This approach could be designed to apply only to new applicants or could be made retroactive to include all licensed ECE programs.

Follow Up on Potentially Problematic ECE Programs and Locations

Another key component of an ECE safe siting program is having a process for referral and follow up on ECE programs identified as having potential problems. If you have multiple methods for identifying potential problems, you will receive referrals from different entities, such as local zoning boards, ECE program licensing groups, and local health departments. You will greatly benefit from establishing a procedure for how your partners communicate information to you about potential problem ECE settings. The procedure could be as simple as an email or telephone communication, or providing a copy of an inspection report or operator certification or questionnaire. After an ECE program is referred, it is a good practice to document all follow-up activities, including all communications. Data evaluations and conclusions about exposures and risks also need to be documented. ATSDR health consultation and technical assistance documents provide a good format for documenting such health evaluations and other follow-up activities and interventions.[13] Maintaining good documentation is also important for tracking the progress and accomplishments of the program and conducting evaluations of how the program is performing.

A good practice is to make one agency or unit responsible for coordinating the follow-up activities. Coordination and communication are extremely important and simpler with a single point of contact. The group responsible for following up does not need to have the expertise to address all the potential issues, but they need to communicate and coordinate with those who have the appropriate expertise. Coordination with staff members who have regulatory or licensing authority for ECE programs is especially important because those persons might have licensing timeframes or deadlines that are pertinent to the follow-up or enforcement activities. Lastly, because the licensing and inspection staff usually have ongoing interactions with operators, it is important to closely coordinate with them on follow-up activities such as site visits or any other activities involving direct communication with the operator.

Types of follow-up activities that might be needed

- Site visit
- Review of environmental site assessment documents
- Review of inspection reports of nearby facilities
- State environmental agency property file review
- Local land record property review
- Coordination and communication with involved parties
- Review of operator submittals
- Review of license materials
- Identify data gaps
- Recommendations for environmental data collection
- Evaluate environmental data, assess exposures and health risks
- Risk communication
- Exposure reduction recommendations

As stated earlier, the group ideally suited for the lead role in follow-up activities is a state health department with expertise in assessing exposures and health risks from hazardous substances in the environment. This is because the follow-up process will conclude with a health call regarding whether the ECE program is safe or whether exposure reduction actions are needed. Those actions might range from soil remediation to drinking water treatment or installation of a sub-slab ventilation system. Because risk communication might be needed as part of follow-up work, the unit taking the lead for follow-up work ideally would have risk communication expertise. The unit with primary responsibility for a safe siting program can also serve as a resource for ECE program providers on general environmental exposures and risks.

Education, Outreach, and Awareness

Education, outreach, and awareness are important components of a safe ECE siting program. Outreach and awareness are important at the very beginning of the process when doing initial partnership building. But it is important to continue outreach and awareness activities even after your program is up and running. Ongoing marketing enables the program to

- Showcase the program's benefits and successes, which could lead to increased recognition and resources.
- Learn about new partners to bring into the program.
- Receive feedback that can be used for program improvement.
- Ensure that partners and others have up-to-date information about the program.

Chapter 6 lists outreach and awareness resources.

[13] The CCDBG has a technical assistance network that may also help coordinate a follow-up intervention. See the following for more information: https://childcareta.acf.hhs.gov/.

NON-REGULATORY MODEL — CONNECTICUT[14]

In 2007, the Connecticut Department of Public Health (CT DPH) created its Child Care Screening Assessment for Environmental Risk (SAFER) Program, available at: www.ct.gov/dph/safer. The SAFER Program finds child care facilities on or near properties where the presence of hazardous chemicals could harm children. It also strives to raise awareness at the state and local level about safe child care siting. CT DPH's Environmental and Occupational Health Assessment (EOHA) Program [15] created the SAFER Program to prevent occurrences similar to the Kiddie Kollege incident (see Chapter 2 for details) from happening in Connecticut. The SAFER Program is a partnership between EOHA and the Division of Licensing within the Connecticut Office of Early Childhood (OEC).[16] The Division of Licensing is responsible for regulating child care programs in Connecticut.

Child Care Licensing in Connecticut

Connecticut requires that child care programs be licensed. Licenses are issued by the Division of Licensing, within the Connecticut Office of Early Childhood (OEC), an executive branch state agency. Most licensed programs (~60%) are family daycare homes, providing care in a private home to six or fewer children. The remaining licensed programs are group homes (providing care to seven to 12 children) and ECE programs (providing care to more than 12 children). The OEC's Division of Licensing issues child care licenses for a period of four years. Per state law, child care programs are inspected by OEC's Division of Licensing before licensure and on a regular basis thereafter (approximately annually). Local health departments are also responsible for inspecting child care programs in Connecticut (approximately every other year).

Connecticut's SAFER Program is non-regulatory, meaning that no specific regulations mandate that the program exists or that its recommendations be implemented. Connecticut chose to pursue a non-regulatory approach because it was quicker and easier to implement than establishing new regulations, and the approach provided more flexibility than a regulatory program. Connecticut determined that a non-regulatory program also would require a smaller investment of resources to initiate and maintain than a regulatory approach would require. Additionally, Connecticut had evidence that the regulated community (meaning licensed providers) would be more likely to embrace the SAFER Program if it did not involve regulatory requirements that might make it more costly to open or operate an ECE program. Even though no regulatory requirements mandate that ECE programs follow SAFER Program guidelines and recommendations, Connecticut has not encountered any significant difficulties with owners or operators complying with SAFER Program recommendations.

Connecticut SAFER Program's Initial Case

In 2007, Connecticut's SAFER Program identified a new child care center in East Hampton, CT, with the same address as a former manufacturing facility. SAFER Program staff reviewed environmental reports indicating that soil on the property had high levels of arsenic. Soil in the playground on the property had never been tested. Through the actions of the SAFER Program, the child care property owner tested the playground and quickly acted to remove high levels of arsenic that were found in the playground soil. Without the SAFER Program, the arsenic contamination would not have been discovered and children would have been exposed to high levels of arsenic.

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[14] In this section, the term child care and daycare are used to be consistent with the State of Connecticut's language.

[15] The EOHA program resides within the Environmental Health Section of the Connecticut Department of Public Health, an executive branch agency. EOHA assesses human exposures and risks from hazardous substances in outdoor and indoor environments. EOHA also develops health education materials to help people understand and reduce environmental and occupational health risks.

[16] When Connecticut's SAFER Program was started, the program responsible for licensing child care programs was located within the Department of Public Health. It has since been moved to the Office of Early Childhood, an executive branch agency established in 2013 to coordinate and improve early childhood programs in Connecticut.

One EOHA staff person (funded under the ATSDR Cooperative Agreement Program for Environmental Public Health activities)[17] devotes approximately 5% of her time to SAFER activities. These activities include

- Evaluating child care facilities referred through the SAFER Program.
- Conducting annual training for inspectors.
- Performing outreach and awareness activities.
- Conducting program evaluation and improvement activities.

This work is done with Connecticut's existing ATSDR Cooperative Agreement Program staff and currently represents approximately 2%–3% of their funded staff resources. During the time when program design and start-up was occurring, staff resources were somewhat higher. Work done under Connecticut's SAFER Program is consistent with ATSDR's Cooperative Agreement Program objectives because it helps identify exposures from environmental hazards involving sensitive populations (young children). For child care licensing staff, the SAFER Program does not add measurably to their workload because the program is built around inspection activities they already perform.

The first step CT DPH's EOHA program took in building its program was opening a dialogue with staff responsible for licensing ECE programs in Connecticut. This initial meeting provided an opportunity for the two programs to learn about each other. Up to that point, the two programs had little interaction. At the initial meeting, EOHA presented an idea for a pilot program whereby the licensing staff would cross-check the address of an ECE program seeking a new license or renewal with a list of hazardous waste site addresses available on the Connecticut Department of Energy and Environmental Protection (CTDEEP) website. ECE programs on a street matching the street of a waste site would be referred to EOHA for follow up. Licensing staff agreed to implement the pilot program and almost immediately identified a child care center that had recently opened on the site of a former manufacturing facility that was listed in CTDEEP's hazardous waste sites list. EOHA's follow-up identified a need for soil testing in the playground on the child care property. Soil results showed elevated levels of contamination that were promptly addressed by the property owner. Through this initial case, Connecticut learned that it was possible to identify and effectively address environmental issues at child care centers *without* new regulations. The pilot program showed that a larger number of ECE programs might be operating on contaminated land and a more comprehensive program was needed.

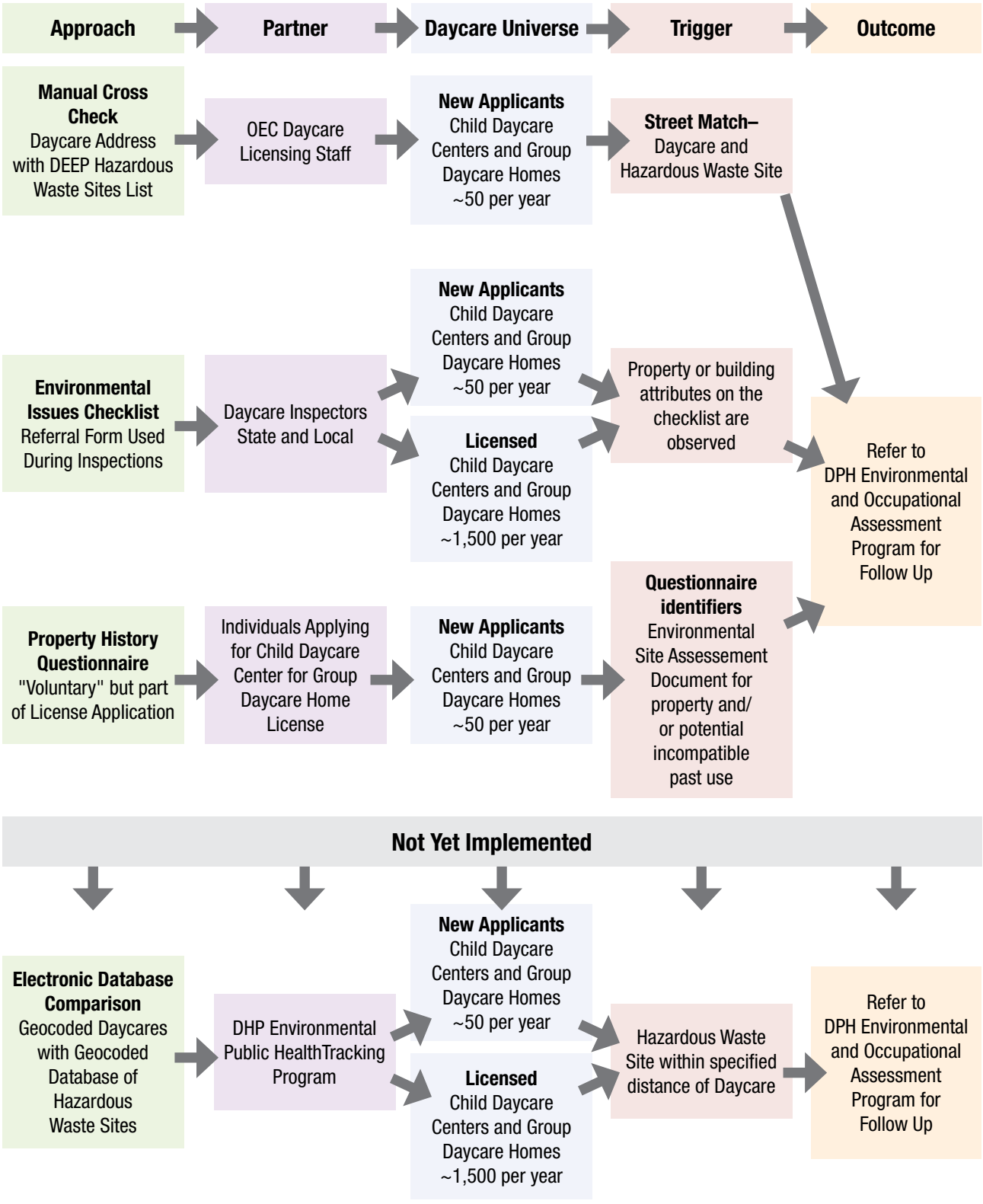
SAFER Program Approaches

Building on the success of the pilot program, the SAFER Program was designed using three approaches to finding ECE programs with potential environmental concerns. Figure 1 is a logic model showing how the SAFER Program finds and addresses potential problem ECE programs. Connecticut recognized that because no single approach is perfect, using a combination of tools to identify potential problems would make it less likely that problems would be missed. The left (yellow) column of the logic model shows approaches used to identify potential problem ECE program. The SAFER partners listed in the green column use the approaches to identify ECE programs that could pose exposure concerns. The GIS-based approach is not yet being used. All ECE programs identified using SAFER approaches are referred to EOHA for follow up. The three approaches used by Connecticut and the follow-up process if a child care is referred are discussed below.

SAFER Logic Model
No single approach is perfect. Using a combination of approaches to identify potential problems provides greater assurance that no issue will be missed.

[17] The ATSDR Partnership to Promote Localized Efforts to Reduce Environmental Exposures (APPLETREE) Cooperative Agreement program supports state efforts to evaluate and respond to environmental public health issues involving human exposure to hazardous substances in the environment.

Figure 1. Logic model for Connecticut's SAFER Program



Address Crosscheck

Licensing staff compare the street name of an ECE program (at the time the center applies for a license) with addresses in the Connecticut Department of Energy and Environmental Protection's (CTDEEP) hazardous waste sites list. Currently, this crosscheck procedure is performed manually. The long-term goal is to use GIS technology to search for new and existing ECE programs near hazardous waste sites. The CTDEEP hazardous waste sites list includes locations that trigger Connecticut's regulatory requirements for waste site cleanup. The SAFER Program was designed with an understanding that some properties with hazardous chemicals are missing from the list. No single approach is perfect. Using multiple approaches for finding potential problem ECE programs decreases the likelihood that problems will be missed.

Property History Questionnaire

EOHA developed a questionnaire for ECE program license applicants. The questionnaire is part of Connecticut's license application package and is included in Chapter 6 of this manual. The questionnaire asks license applicants to provide information about the past use of the ECE property and buildings. Questions include whether the property was used as a dry cleaner, farm, gas station, landfill, manufacturing facility, nail or hair salon, funeral home, or shooting range. The questionnaire also asks whether the license applicant is aware of any environmental site assessment documents prepared for the property. The questionnaire allows an applicant to indicate that they do not know the property history. However, applicants are encouraged to answer all questions to the best of their ability. When licensing staff review the application, they refer the child care to EOHA for follow up if the questionnaire has any former use issues identified or if site assessment documents exist for the property.

Inspector Referral Form

ECE programs in Connecticut are inspected by the state before licensure and regularly thereafter. Local health departments also regularly inspect child care facilities. The referral form (see Chapter 6) is a tool to help inspectors identify and document property or building attributes that could signal the presence of hazardous contamination. In this way, the form brings programs to the attention of the SAFER Program. The referral form also helps inspectors identify types of businesses (such as a dry cleaner or nail salon) operating next to a child care facility that could adversely affect the environmental quality of the care. During regularly scheduled inspections, the inspector only needs to spend a little extra time to look for building and property attributes included in the referral form. EOHA provides yearly training for child care inspectors on what to look for and how to refer child care facilities to EOHA. The referral form also was provided to local health department staff to use when they conduct inspections. Inspectors view the form as a useful tool to help them ensure that ECE programs are operating in buildings and on land that is as safe as possible. During an inspection, if any of the items listed in the form are observed, the inspector refers the program to EOHA for follow up. In addition to completing the referral form, inspectors are encouraged to take photos or make a simple sketch of anything they observe that raises their concern. They are also encouraged to contact EOHA staff if they have any questions about something they saw while on a child care inspection.

CT SAFER Program

Connecticut's SAFER Program focuses on children care centers and group child care homes. Family child care homes (providing care to six or fewer children in a private home) are not a primary focus because private residential homes are less likely to be located on properties with a past industrial use or in buildings with a co-located industrial use. Although the approaches used by the SAFER Program to find potential problem child cares are not routinely applied to family child care homes, inspectors understand that if they observe something of concern at a child care home, they can refer it for follow up. Further, Connecticut includes family child care homes in education/outreach activities.

Follow-up Process

An ECE program location identified through any of the approaches is referred to EOHA. This referral is done by email or telephone call, or both. EOHA gathers and reviews the environmental and other relevant information available for the property. EOHA coordination with the local health department, CTDEEP, EPA, the ECE program operator, the property owner, and the licensing staff is a large part of follow-up activities. After gathering available records and reports, EOHA staff may conduct a site visit of a child care to resolve any remaining issues or questions. For example, they might make a site visit if a business such as a nail salon is located next to an ECE program and within the same building. During the site visit, odor issues are noted and ventilation systems are observed. Another situation in which a site visit is likely to be conducted is when a program is located on a property that had soil or groundwater testing or remediation because of the presence of hazardous chemicals. At the site visit, the location of the playground is observed to decide whether additional testing in the playground is needed. Site visits are always coordinated with the inspector and the local health department. If additional action is needed, such as collecting environmental data, EOHA

- Coordinates with all appropriate parties and evaluates the data.
- Provides recommendations to reduce exposure from environmental contaminants.
- Helps families and child care workers understand potential exposures and the risks those exposures might pose.

The final outcome of each ECE program follow-up is documented in written communication to licensing staff and summarized in a database maintained within EOHA.

Over the years since the SAFER Program was launched, the EOHA follow-up process has resulted in recommendations for soil, air, dust, and drinking water testing and soil remediation at a number of ECE programs. EOHA has not had an instance where a child care facility refused to comply with SAFER recommendations. This is because EOHA coordinates closely with the licensing staff, the local health department, and CTDEEP on all SAFER recommendations. Consequently, all recommendations are agreed to before they are communicated to the ECE program property owner. Further, SAFER recommendations are communicated by the local health department or licensing staff, both of whom have regulatory authority, and not by EOHA, which has no regulatory authority. These are likely the key reasons why ECE programs are complying with SAFER Program recommendations, even though they are not under specific regulatory obligation to do so.

Training and Outreach

An important and integral part of the SAFER Program is training and outreach. EOHA provides annual training for OEC Division of Licensing inspectors. The training reinforces what inspectors should be looking for and when they should refer an ECE program to EOHA. The training relies heavily on photos compiled over the years from the many programs that have been referred through SAFER. The annual training is also an opportunity to report on the program's successes and obstacles, troubleshoot problems and discuss whether procedural or programmatic changes are needed.

Private Well Testing Outreach

Connecticut's SAFER Program recently mailed private well testing recommendations to more than 600 child care facilities whose drinking water likely comes from a private well (based on their geographic location). Most of the recipients of this educational material and testing recommendations were family child care homes. The SAFER Program undertook this activity because basic water testing required by Connecticut's child care licensing regulations does NOT cover all the harmful contaminants that could be present in well water. This activity raised awareness about the importance of private well testing and gave child care operators specific recommendations about how to test, what to test for, how frequently to test, and where to find help with interpreting well test results.

Since the SAFER Program began, EOHA has conducted a variety of outreach efforts. Goals of those efforts have included the following:

- Making partners and stakeholders aware of the SAFER Program and the assistance it can provide.
- Raising awareness at the local land use planning and zoning level about the importance of asking questions about the suitability of a property before granting a local permit for an ECE program.
- Raising awareness among local permitting entities of the need to protect the health and safety of ECE program children when considering permit requests from businesses seeking to locate next to an existing daycare.

When the SAFER Program was first launched, EOHA created a brochure describing SAFER and gave it to local health departments, local planning and zoning agencies, CTDEEP, and others. EOHA staff members have given presentations about SAFER to local planners, CTDEEP, Connecticut licensed environmental professionals, local health department staff, and others. EOHA also posted SAFER Program outreach materials on the CT DPH website, available at www.ct.gov/dph/safer. This material is also accessible through the licensing website within the Connecticut Office of Early Childhood.

Connecticut's Program Benefits, Program Improvement, and Lessons Learned[18]

Over the eight years that Connecticut's Child Daycare SAFER Program has operated, approximately 46 ECE programs have been referred to EOHA for follow-up. Of these referrals, nine (20%) had potential environmental problems that needed additional environmental assessment. The additional data identified four ECE programs with contamination that needed to be addressed through soil remediation, drinking water treatment, or by providing bottled water. In all of these cases, the SAFER Program identified environmental exposures that might not have been identified through other channels. This shows the primary benefit of the program.

Connecticut SAFER Program: Track Record

- Approximately six ECE programs per year are referred for follow up.
- On average, one ECE program per year has potential problems warranting environmental assessment.
- So far, four ECE programs needed interventions to reduce exposure to contamination.
- Referrals represent less than one percent of total ECE programs in Connecticut.
- Work load has been manageable with existing staff.

The SAFER Program has also provided ancillary, unanticipated benefits. Before initiating the SAFER Program, EOHA staff and licensing staff had little contact with each other (even though at the time, both programs were housed in the same branch within CT DPH). The SAFER Program has fostered new areas of interaction between licensing staff and EOHA. For example, child care inspectors identified a need for information and resources regarding safer alternatives for sanitizing and disinfection products used in daycares. Because of the SAFER Program, they contacted the EOHA Program for assistance. In response, indoor environmental quality staff within the EOHA Program prepared a fact sheet and provided training to ECE program workers and licensing staff about safer cleaning products and approaches.

[18] The information presented in this section is based solely on Connecticut's experiences and might not represent those of other states.

Some important lessons have been learned since the SAFER Program began. First, the Connecticut experience indicates that most ECE programs do not have environmental problems. Among all ECE programs included in the SAFER Program, only a few (about six per year) are referred for follow up. Of those referred for follow-up, still fewer needed additional testing or remediation. Connecticut's experience also shows that the necessary follow-up work can be done using existing state health department staff, without slowing the licensing process. A major concern when the SAFER Program was first being discussed in Connecticut was that the program would slow the licensing process.

Connecticut has also learned that it is important to establish clear protocols and build good documentation for all daycares referred for follow-up. Establishing clear protocols and documentation ensures that the program will be able to sustain itself, even with changes in staff or management. Maintaining good documentation of all follow-up work also ensures that ECE programs that received a prior SAFER Program follow-up can be identified quickly and easily if they come through the referral process again.

In Connecticut's SAFER Program, EOHA is the primary unit responsible for operating the program. EOHA is the group within CT DPH with the expertise to evaluate exposures and risks from hazardous substances in the environment. Connecticut has learned through its SAFER Program experience that a unit with this type of expertise is the ideal group to coordinate, promote, and support a statewide safe child care siting initiative. Connecticut has also learned that a program works more effectively if a single unit assumes responsibility for overall coordination and promotion of the program.

As previously mentioned, Connecticut chose to pursue a non-regulatory ECE siting approach because it was quicker and easier to start using than establishing new regulations. When EOHA first discussed ideas for the SAFER Program with the licensing staff, it was agreed that a non-regulatory program would be more likely to be viewed positively by ECE operators than additional regulations, which might be viewed as onerous. By not having a rigid regulatory structure, SAFER Program staff can easily modify procedures and approaches as needed. Connecticut operates its SAFER Program with existing resources, which probably could not have been done if the program had involved new regulations. Although no regulatory requirements mandate that SAFER Program guidelines and recommendations be followed, Connecticut has not yet encountered significant difficulties regarding ECE program compliance with the recommendations. EOHA coordinates closely with the licensing staff, the local health department, and CTDEEP on all SAFER recommendations. Consequently, there is concurrence on all recommendations before they are communicated to the child care facility or property owner. Further, SAFER recommendations are communicated by the local health department or child care licensing staff, both of whom have regulatory authority, and not by EOHA, which has no regulatory authority. These are likely the key reasons why ECE programs are complying with SAFER Program recommendations, even though they are not obligated by regulation to do so.

Connecticut's experience has also highlighted aspects of the SAFER Program that need improvement. First, a handful of inspectors at the state and local level refer most of the ECE programs. Connecticut is working on ways to improve training content and target training messages to those inspectors who have never made a referral. Connecticut also knows that awareness of the SAFER Program is low among local planning and zoning officials. Connecticut has never received a referral from a local planning or zoning department. Additional outreach to local planning departments would increase awareness.

A recently completed improvement to the program is a redesign of the property history questionnaire given to new license applicants. State licensing staff and ECE program applicants using the form identified elements that could be improved. The redesigned questionnaire is now fillable electronically and is simpler to use, which should improve information collection.

Although Connecticut has had great success with its SAFER Program, the lack of enforceable regulations might be viewed by some as a drawback.

A SAFER Program Success Story

A child care center, located on a former herbicide and pesticide manufacturing and storage facility site, was applying for a license to expand its programs. The applicant indicated on the property history questionnaire that the site had been used for "factory/manufacturing/industrial" and that environmental assessment reports existed for the property. This triggered the child care center to be referred to CT DPH (EOHA) for follow up. EOHA obtained the environmental reports and learned that the property was in a clean-up program at CTDEEP that had no regulatory timeframe to mandate a cleanup. The environmental reports showed that soil arsenic levels on the property were as high as 270 parts per million (ppm), greatly exceeding Connecticut's arsenic clean-up standard of 10 ppm. Through the SAFER Program referral and follow-up process, additional sampling was performed at the property to better delineate the soil contamination, and interim remedial measures including excavating contaminated soil and covering with clean soil were implemented. These actions would likely have occurred eventually, but it might have been many years before cleanup occurred. Through the SAFER Program, the contamination was identified and addressed quickly, which resulted in a reduction of potential exposures to children and staff. In addition, EOHA recommended health and safety measures to prevent exposures during remediation and helped communicate with the child care staff and families. Without the SAFER Program involvement, the new license allowing the child care center to expand and enroll more children would have been granted before completion of the remediation. Without the additional assessment and cleanup of contaminated soil, children attending the expanded child care center could have been exposed to the contaminated soil.

REGULATORY MODELS — NEW JERSEY AND NEW YORK[19]

Some states have adopted licensing regulations incorporating general site and location criteria that could be used to address proximity to environmental hazards [19]. Two states (New Jersey and New York) currently have specific requirements for ECE program applicants to submit written certification or documentation of any necessary environmental inspections/testing. New York and New Jersey adopted new regulations mostly in response to highly publicized exposures to environmental hazards in ECE program [44].

Links to Information on New Jersey and New York State's Regulatory Programs

New Jersey: Environmental Guidance for All Child Care Facilities and Educational facilities is available at http://www.state.nj.us/dep/dccrequest/

New York: Guidance from the New York State Office of Children and Family Services is available at http://ocfs.ny.gov/main/documents/docschild care.asp

The New Jersey regulatory approach was enacted after the Kiddie Kollege incident (see Chapter 2). New Jersey amended its state licensing regulations to require that child care centers cannot be located near or next to areas that the Office of Licensing determines to be hazardous to the physical health and safety of the children [45]. New Jersey also has guidelines about environmental conditions that apply when a child care center is renewing its license or relocating. The guidelines require the owner of the child care facility to submit written certification to the Office of Licensing as to whether the building was ever classified as "factory/industrial, high hazard, storage, dry cleaners or nail salons, gas stations, or funeral homes." If the child care center was classified as any of those, a licensed indoor environmental consultant also must perform an indoor environmental health assessment (IEHA). The IEHA is submitted to the Department of Health for review, and the facility owner contacts the Department of Environmental Protection to determine whether additional steps and corrective actions are needed to address the risks of the location of the child care center [45].

As stated above, Jackson Steel is a federal National Priorities List Superfund site, with a potential for causing indoor air exposures to the Tutor Time daycare center. Because of the issues at the Tutor Time site, the New York State Attorney General's Office released a report giving recommendations on how to prevent similar events from occurring. The recommendations included ideas such as EPA asking schools and ECE programs located near Superfund sites to notify parents of children using those programs about the proximity of Superfund sites [23].

By 2005, New York amended the state licensing regulations to require ECE programs to have certification that the program, its property, and the surrounding environment was free of environmental hazards. If the historic or current use of the property indicates that environmental hazards are present, inspection and testing must be done [46].

New Jersey and New York both require that information about environmental hazards be submitted as part of the licensing and renewal process. However, New York does not have statutory or regulatory provisions requiring that license applicants obtain review by other state agencies. The state's approach relies more heavily on the applicant to determine whether environmental hazards necessitate the involvement of other agencies [19]. More specific details of the New York and New Jersey approaches can be found at: http://www.eli.org/research-report/reducing-environmental-exposures-child-care-facilities-review-state-policy.

[19] In this section, ATSDR is referring to ECE programs as "child care" to be consistent with the language used by the states of New Jersey and New York.

Several other states have adopted licensing regulations incorporating general site and location criteria that could be used to address proximity to environmental hazards. These provisions are similar in scope, but they vary in their precise wording. Unlike the New York and New Jersey approaches, the regulations do not include an explicit requirement for applicants to submit written certification or documentation of any necessary inspections or testing [19].

New York and New Jersey both amended their regulations, mostly in response to highly publicized events of exposure to environmental hazards in ECE programs. New Jersey has detailed regulatory requirements relating to environmental conditions at the site of ECE programs. Most ECE programs in New Jersey must obtain an environmental assessment of the site in connection with the licensing process; an indoor environmental assessment may also be required, depending on the facility's prior use and current location. The cost of the assessment and license is incurred by the daycare operator. However, some grants are available to cover this expense. ECE program licensing regulations in New York require applicants to submit written self-certification that the surrounding neighborhood and environment are free from environmental hazards. If potential hazards exist, applicants must consult with the appropriate state agencies and obtain any needed inspections or testing. Several other states have general statutory or regulatory provisions prohibiting health or environmental hazards in the area of an ECE program. States can build on these models by including explicit requirements for identifying and addressing environmental hazards from current or former uses of the site or nearby facilities as part of the licensing process. State agencies can also help providers in identifying and addressing potential site hazards through formal, non-regulatory initiatives [19].

CHAPTER 6: SAFER ECE PROGRAM SITING PROGRAM TOOLS

This chapter contains tools you can use or modify to build a safe ECE siting program, including the following:

- Forms developed by two state health departments for their own state safe siting programs.
- Questions to start conversations about safe siting.
- Training topics for different audiences, including ECE program inspectors, ECE program owners and operators, local zoning official, and local or state health departments.
- A primer on unique risk communication challenges when children have been exposed to hazardous substances at an ECE program, and how to address such challenges.
- GIS techniques that help in identifying the proximity of ECE programs to areas of hazardous materials and sources of data for use in analysis.

SAFER ECE PROGRAM SITING PROGRAM FORMS

Connecticut and New York have developed forms to evaluate whether ECE programs are safely sited. The forms may be modified to meet each program's specific needs.

CONNECTICUT ENVIRONMENTAL ISSUES REFERRAL FORM FOR INSPECTIONS OF CHILD CARE CENTERS AND GROUP CHILD CARE HOMES

Inspectors use this form during their regular child care inspections to identify

- Lands or buildings that might have residues of hazardous chemicals.
- Lands or buildings that were previously used for industrial operations.
- Businesses located within the same building complex as the child care center whose use of hazardous chemicals could affect the center.

If an inspector observes any of the items on this form, the property is referred for follow-up. The form is available at http://www.ct.gov/dph/lib/dph/environmental_health/eoha/pdf/environmental_issues_referral_form_for_inspections_june_30….pdf.

Connecticut Property History Questionnaire for Child Care Center and Group Child Care Home Applicants

A property history questionnaire is included in the application package for a child care license. The questionnaire asks applicants for information about the following:

- Past ownership and use of land and buildings planned for child care use.
- Available environmental site assessment reports for the child care property.
- Observations on the property that could indicate the presence of hazardous materials or a past use of hazardous material.

The questionnaire provides applicants with guidance about how to find property history information. The form is available at http://www.ct.gov/dph/lib/dph/daycare/pdf/property_history_questionnaire.pdf.

Connecticut Child Care Well Testing Letter

When a child care center (or more commonly, child care operating in a family home) uses a private well for drinking and cooking water, additional testing might be needed to be sure the water is safe to use. Basic well testing required by child care licensing regulations does not cover all the harmful contaminants that could be in private well water. The letter strongly encourages the child care operator to test their well for the full range of harmful contaminants and includes testing guidance.

Appendix B shows an example of the letter.

New York Environmental Hazards Guidance Sheet

This guidance sheet

- Offers an overview of potential hazards at a child care center.
- Describes potential hazards that might affect child care centers and early learning facilities, and the exposure path and route of exposure to harmful substances.
- Lists common sources of environmental hazards that might need to be evaluated.
- Lists environmental hazards primary contacts in a table that summarizes hazards by group, contaminant, and the appropriate agency to provide assistance when needed.

The form is available at
http://ocfs.ny.gov/main/Forms/Day_Care/OCFS-LDSS-7040%20Environmental%20Hazards%20Guidance%20Sheet.pdf

IDENTIFYING AND TRAINING PARTNERS AND STAKEHOLDERS

Partners and stakeholders can provide essential support to building a safe ECE siting program. Identifying and training these groups can provide an effective strategy to sustaining and expanding the capacity of a program.

Identifying Partners and Stakeholders

Among the many potential partners and stakeholders for a safe siting program are the following:

- ECE inspectors.
- ECE licensing boards.
- ECE owners/operators.
- Local, territorial, tribal and state planning and zoning officials.
- Local, territorial, tribal and state health department officials.
- Local, territorial, tribal and state environmental protection officials.
- Other stakeholders identified as part of the state safer siting program [47] [48].

Chapter 4 contains a complete discussion about potential partners.

Table 6.1. Potential questions to discuss with your ECE safe siting partners and stakeholders

Partner/ Stakeholders	Questions
ECE program licensing agencies	• Does the licensing agency reside at the state, county, or local level? • How frequently are ECE programs inspected? By whom? • How many ECE programs are licensed? • Are there any third party certifications for ECE programs? • Are there different categories of licensed ECE programs (e.g., family daycare, home daycare, child care facility, early learning centers, and child care center)?
Zoning/planning	• Does an ECE program need local zoning approval? • What does a local zoning review process involve? • If /when an ECE program needs to come before a planning board for approval, what is required? What considerations are discussed?
Hazardous waste sites/contamination located near ECE programs	• Does anyone maintain lists of ECE programs, hazardous waste sites, and other locations/facilities using hazardous chemicals to see if they are located near each other? Are the locations geocoded? • Do facilities using hazardous chemicals (e.g., nail salons, dry cleaners, auto body shops) receive inspections? How frequently do inspections occur? • How is a hazardous waste site identified, assessed, and remediated? • Do policies or regulations address proximity to potential environmental hazards when siting ECE programs? How is the policy or regulation administered? How is compliance demonstrated? • Have maps been compiled that indicate locations at risk for elevated levels of naturally occurring contamination, such as radon, arsenic, and asbestos?

Training Partners and Stakeholders

Training recommendations and sample training content in this manual are provided as guidance, and can be adapted to each state siting program's needs.

Training for Inspectors

The best way for state and local ECE program inspectors to develop the knowledge and skills to conduct comprehensive ECE program inspections is through training. Regular training provides ongoing opportunities to use the latest information and science for identifying potential environmental hazards at or nearby ECE program settings that could affect the ECE program. Training can prepare inspectors to recognize signs of hazards in an ECE location. Some of the various topics to consider for inclusion in an inspector training program include the following:

Methods to identify ECE sites with potential environmental concerns

- Evaluation of the past use of the building or property at which the ECE program is located.
- Use of geocoding and other databases to identify industries located close to the ECE program.
- Crosschecking of new ECE programs to identify industries located close to the ECE setting.
- Review of inspection reports that identify whether the ECE program building or the surrounding area might pose a threat to children and staff from exposure to hazardous materials.

Identification of potential hazardous materials at the site

- Assessment of the building to see if it has characteristics of a former mill, factory, or industrial facility, such as a loading dock (large delivery doors), old brick construction, a cargo elevator, old signs, or machine parts.

- Assessment of outdoor property to see if chemical drums or barrels, old vehicle parts, discarded refrigerators and stoves, demolition debris pile, and barns or farm machinery or equipment are present.
- Assessment of nearby business to determine if they are using hazardous materials that could migrate to the ECE program and harm occupants of the facility. (This is especially important if they are located in the same building as the ECE program.)
- Post-inspection follow-up to address potential problems identified during the inspection process, which might include
  - Gathering additional information about past uses of the building from applicable sources, when available.
  - Performing a record review of the property.
  - Conducting a follow-up site visit if potential hazards are identified after the initial inspection.
  - Recommending actions to protect children and staff from exposure to hazardous materials when identified.
- Review of state regulations, when safe siting is mandated by law, to determine what to look for when evaluating potential hazards at a site.
- Review of guidance for safe siting in states where the program is voluntary to determine what to look for when evaluating potential hazards at a site.
- Partnerships with ECE programs to conduct risk communication activities when environmental hazards are identified at ECE programs. Risk communication is the exchange of information to increase understanding of health risks. For more information, please refer to the "Risk Communication" section of this manual, found on page 91.

Training for Local Zoning and Planning Officials

Local zoning, planning, or health department officials are often responsible for approving permits for ECE programs. Ideally, training for these officials will include instruction in how to

- Determine land uses next to and near ECE programs.
- Determine the former uses of the ECE program property.
- Ask for assistance from the state environmental protection department to evaluate potential hazards before approving permits for businesses located next to or near ECE programs that use hazardous materials.
- Contact the state ECE program licensing agency to see if they have information that would preclude a site from being used for an ECE program.
- Use land use databases to identify locations of facilities that use hazardous materials at this time and facilities that used hazardous materials that might have been spilled or released to the environment (Appendix C includes a list of potential land use databases).

Training for Local, Territorial, Tribal, and State Health Departments and Other Stakeholders

Stakeholder engagement can also work to increase awareness and educate local and state officials and other stakeholders about the importance of safe siting of ECE programs. Consider including the following topics in training for local, territorial, tribal, and state health departments and other stakeholders:

- Former uses of the site that might have left substances that could harm the health of people exposed to those substances.
- Examples of migration pathways for harmful substances from other sites or nearby infrastructure or activities that might occur.

- Naturally occurring harmful substances already in the environment, such as radon in indoor air and lead in drinking water and their health effects.
- Biological and chemical contaminants in drinking water that can be harmful to people's health.

Chapter 4 provides a more comprehensive description of naturally occurring harmful substances and actions you can take to protect children and staff from exposure. It also has a more comprehensive description of contaminants commonly found in drinking water, and actions that can be taken to improve drinking water quality.

ECE PROGRAM LICENSING BOARDS, AND OWNERS OR OPERATORS OF ECE PROGRAMS

Most ECE program providers assume someone will notify them if a site is not appropriate for an ECE program. Such notification does not happen in some cases. Therefore, it is important to form partnerships with ECE program licensing groups to raise awareness about the importance of safe ECE siting and the benefits of adopting safe siting guidelines to protect children's health. As partners, licensing groups can share concerns and ideas and provide safe siting training and educational resources to ECE program owners and providers.

Topics to consider for inclusion in an ECE program licensing provider educational program include the following:

- Why safe siting is important for ECE programs (e.g., children are more vulnerable to environmental hazards than adults).
- Identification of facilities that use hazardous materials and are in the same building as an ECE program or nearby (i.e., explain the potential hazards the facilities pose to children and staff).
- Identification of characteristics of the property that indicate it might have been used for industrial purposes. (Refer to the list provided above in "Inspector training — Identification of potentially hazardous materials at the site" for more information.)
- Use of a property history questionnaire (Appendix A) for ECE program applicants to complete to determine if the building had been used in operations involving hazardous materials.
    - Potential sources of property information include the landlord or former owner of the property; local zoning officer, planning official, or building inspector; local health department officials; city officials, including tax assessor, town land records, local fire marshal, economic development agency, or historical society.
    - Information on how to access databases directly or through other sources, such as state environmental agencies, to determine ownership and past uses of potential daycare sites.
- Any other actions ECE program providers might take to protect children from environmental hazards at their programs.

The Connecticut Department of Public Health has developed a training program for its SAFER (Screening Assessment for Environmental Risk) Program. The training program and an education and outreach brochure used to raise awareness about safe child care siting are available at www.ct.gov/dph/safer.

RISK COMMUNICATION

ECE programs face special risk communication challenges when children might have been exposed to hazardous substances at the facility. Effective risk communication can help calm people's fears by telling them what actions are being taken to protect children and staff and to answer health questions.

Every ECE program would benefit from having a risk communication plan to follow if children[20] or staff are exposed to chemical or radiological hazards. Ideally, the plan should provide guidance on informing parents, guardians, and staff about what has happened, how health could be affected, and actions being taken to prevent future exposure to hazardous materials. Plans are best developed before an event occurs. Some ways this can be done include the following:

- Write generic letters that use simple language that can be customized to give information. about an event and the steps being taken to protect the health of children and staff.
- Develop key messages so that all staff members provide the same messages about the event to parents, staff, media, and others affected by the event.
- Develop a plan to provide key messages and information via texting, email, or the daycare website, when applicable.

When developing a risk communication plan for ECE programs, special consideration can be given to the following:

- Partner with the local and state health departments, pediatric environmental health specialty units (PEHSUs)[21] whose doctors specialize in health effects caused by children's exposure to hazardous material in their environment, or ATSDR, to develop simple, easy to understand health messages.
- Partner with a local physician or other health care provider who is trusted by the community and can talk about potential health effects from exposure to the hazardous substance.
- Test your messages before they are released by having them read by someone who is not familiar with the event to be sure they are understandable.
- Designate one spokesperson to talk to the media about the event.
- Deliver three key media messages based on facts and without speculation.
- Provide information about the event to parents, guardians, and staff as soon as possible (this also helps counter errors that might be reported elsewhere).
- Tell what is known and focus on the specifics of the event and the potential effect it can have on the health of children and staff.
- Tell what is not known, and the actions that are being taken by the ECE and others, such as local, state, and federal emergency response agencies, to get the information needed to address public health issues.

Message mapping techniques, such as the following, provide an effective strategy for risk communication:

- Develop the three most important key messages to deliver to groups affected by the exposure, such as parents, staff, and the media.
- Write three supporting messages or facts for each key message.
- Keep the messages short and concise.
- Develop a separate message map for each group because the key messages for each group will be different.

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[20] CCDBG recipients are required to have emergency plans and Head Start, for example, has requirements that ensure programs communicate with parents in an emergency or other health-related situations.

[21] See http://www.pehsu.net/ for more information.

Appendix C includes a message map template and an example of a completed message map for reference.

Use the method(s) that will work best for each ECE program. Tell parents at the time their child enters the ECE program how information will be shared, so they will know how they will be notified if an event occurs.

The Centers for Disease Control and Prevention has developed a risk communication guidance manual, *Crisis Emergency Risk Communication by Leaders for Leaders*, available at http://emergency.cdc.gov/cerc/resources/pdf/cerc_2014edition.pdf.

GEOGRAPHIC INFORMATION SYSTEM

Geographic information system (GIS) resources can be used to map, visualize, and analyze spatial data easily. Environmental exposure investigations lend themselves to mapping. GIS tools can help determine the proximity of ECE programs to industries that use hazardous materials. This assessment can determine if the ECE program could be affected by hazardous materials from activities near the ECE program. GIS is a useful tool for identifying hazardous waste sites or releases near an existing or planned siting of an ECE program. Although it can help identify potential issues, it cannot rule out all sources of concern. Identifying a potential problem does not mean the property is not safe, but that additional investigation is warranted.

GEOCODING

Geocoding is the process of assigning geographic coordinates (latitude and longitude) to a street address. The full street address of the ECE program should be used for geocoding to most accurately locate the building on the map. Keep in mind that some facilities list a central office address in some databases, not the site having the hazardous materials. Therefore, environmental hazards should be geocoded to the physical street address of the toxic facility for accurate results. In addition to address-match geocoding, electronic parcel data can be used, where available, to refine property locations.

Note that positional errors in geocoding can result in exposure misclassification. You can validate geocoded building locations with aerial photos or imagery available through Google street view or other commercially available imagery.

BUFFER ANALYSIS

Buffer analysis can be used in GIS to create a new polygon around a feature (ECE program) on a map to identify environmental hazard sources inside the buffer zone. The area of the buffer is determined by the radius selected by the user. Buffer analysis can identify any facilities or industries that use hazardous materials close to the ECE program. A map can then be generated that shows the location of the ECE program in relation to businesses that use hazardous waste. The map can be used to determine if the ECE programs might be at risk for exposure to emissions from the businesses.

DATA SOURCES

Many sources are available for GIS environmental data at national, state, and local levels. Table 6.2 lists some of the websites that offer GIS data for environmental hazards.

Table 6.2. Online GIS sources with environmental hazards datasets

Source	Website	Description
American Community Survey, U.S. Census Bureau	http://www.census.gov/programs-surveys/acs/	Census-based information for local officials, community leaders, and businesses to understand the changes taking place in their communities
American Factfinder, U.S. Census Bureau	http://factfinder.census.gov/faces/nav/jsf/pages/searchresults.xhtml?refresh=t	Census-based housing survey data
Defense sites, U.S. Army Corps of Engineers	http://www.usace.army.mil/Missions/Environmental/FormerlyUsedDefenseSites/FUDSGIS.aspx	Formerly used sites and related activities from Defense Environmental Restoration Program Annual Report to Congress
Department of Energy	http://www.osti.gov/dataexplorer	Formerly used sites
Esri data and maps (open source)	http://www.arcgis.com/home/group.html?owner=esri&title=ESRI%20Data%20%26%20Maps&content=all	General purpose base map data, including imagery and roads
EnviroAtlas, EPA	http://enviroatlas.epa.gov/enviroatlas/atlas.html	National and community environmental data, redevelopment, and GIS information for consumers, environmental services
Envirofacts, EPA	http://www.epa.gov/enviro/index.html	Air Facility System (AFS), Assessment Cleanup and Redevelopment Exchange System (ACRES), Biennial Report (BR), Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS), Green House Gas (GHG), Permit Compliance System/Integrated Compliance Information System (PCS/ICIS), Radiation Information Database (RADInfo), Resource Conservation and Recovery Act (RCRAInfo), Toxics Release Inventory (TRI), Toxic Substances Control Act (TSCA)
Local data	Specific to State, County, Territory, and City	Include variety of data via county health departments or city government for GIS data, parcel information, health, or environmental-related data
National Environmental Public Health Tracking Network, CDC	http://ephtracking.cdc.gov/showHome.action	Air, water, housing, pesticide, and toxic substances
National Priorities List, EPA	http://www.epa.gov/superfund/sites/npl/where.htm	Superfund and National Priorities List site-related activities
Wastes – Where You Live, EPA	https://www.epa.gov/superfund/search-superfund-sites-where-you-live	Directory of maps and alphabetical listing of state and U.S. territory websites.
Where You Live, EPA	http://www2.epa.gov/home/health-and-environmental-agencies-us-states-and-territories	Listing of state health and environmental agencies that may provide GIS data for environmental hazards; scroll down to each state name to view the listings

Appendix C outlines the Pennsylvania Department of Health's Health Assessment Program's guide to using GIS for siting licensed child care centers.

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APPENDIX A: RESOURCES

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Resources

Resource Topic	Sub Topic	Web Links
Child care policy and siting regulations	Administration for Children and Families regulations	• Child Care Development Fund Block Grant, https://www.acf.hhs.gov/occ/ccdf-reauthorization • Caring for our Children Basics: Health and Safety Foundations for Early Care and Education, https://www.acf.hhs.gov/ecd/caring-for-our-children-basics
	Department of Defense	• DoD Unified Facilities Criteria Design: Child Development Centers, http://www.wbdg.org/FFC/DOD/UFC/ufc_4_740_14_2002.pdf
	General Services Administration	• GSA – Child Care Design Guide, https://www.gsa.gov/portal/mediaId/123406/fileName/designguidesmall.action
	New Jersey	• Environmental Guidance for All Child Care Facilities and Educational Facilities, http://www.state.nj.us/dep/dccrequest/
	New York	• Guidance from the New York State Office of Children and Family Services, http://ocfs.ny.gov/main/child care/default.asp
	Connecticut	• SAFER Program, http://www.ct.gov/dph/safer
Building an ECE siting program	Cross-sector partnership building	• Health In All Policies (Section 4.2 Building Intersectoral Relationships), http://www.phi.org/uploads/application/files/udt4vq0y712qpb1o4p62dexjlgxlnogpq15gr8pti3y7ckzysi.pdf • 12 Steps towards successful cross-sector partnerships, http://thepartneringinitiative.org/tpi-tools/12-steps-towards-successful-cross-sector-partnerships/ • U.S. Department of Health and Human Services and the U.S. Department of Agriculture Joint Policy Statement on Coordinated Efficiencies in Monitoring and Oversight of Early Care and Education Programs, http://www.acf.hhs.gov/ecd/joint-monitoring • *Coordinated Monitoring Systems for Early Care and Education* provides an overview of monitoring and the major early care and education monitoring systems. It offers possible goals for a coordinated monitoring system and describes some approaches to addressing those goals. It also describes 11 topic areas that are important to consider in planning monitoring coordination efforts and highlights the efforts of two states, Ohio and Rhode Island, which are working to coordinate their early care and education systems, https://www.acf.hhs.gov/sites/default/files/opre/coordinated_monitoring_systems_in_early_care_and_education.pdf • *Mapping the Early Care and Education Monitoring Landscape* provides tools to help state and territory leaders document ECE monitoring systems, so they can more effectively plan strategies to coordinate monitoring across various regulations. The tool provides a framework and considerations to support discussions and planning of coordinated monitoring efforts, http://www.acf.hhs.gov/opre/resource/monitoring-in-early-care-and-education
	U.S. Environmental Protection Agency's national voluntary school siting guidelines	• School Siting Guidelines Overview, https://www.epa.gov/schools/school-siting-guidelines • School Siting Guidelines Document, https://www.epa.gov/sites/production/files/2015-06/documents/school_siting_guidelines-2.pdf
	Emergency response	• Crisis Emergency Risk Communication by Leaders for Leaders, http://emergency.cdc.gov/cerc/resources/pdf/cerc_2014edition.pdf
	Model regulations	• New Jersey: Environmental Guidance for All Child Care Facilities and Educational facilities, http://www.state.nj.us/dep/dccrequest/ • New Jersey: *Madden* legislation, http://www.njleg.state.nj.us/2006/bills/PL07/1_.pdf • New York: Starting a Child Care Program, http://ocfs.ny.gov/main/child care/starting.asp

Resource Topic	Sub Topic	Web Links
Drinking water systems	State policies and regulations	Voluntary Standards for Water Supplies and Plumbing, http://cfoc.nrckids.org/StandardView/5.2.6.2 Drinking Water Quality in Child Care Facilities: A Review of State Policy, http://www.eli.org/research-report/drinking-water-quality-child-care-facilities-review-state-policy Drinking Water from Private Wells and Risks to Children — Appendix 1: Flowchart for Testing Well Water, http://pediatrics.aappublications.org/content/123/6/1599.full.pdf Drinking Water Contaminants – Standards and Regulations, http://water.epa.gov/drink/contaminants/
	Federal policies and regulations	Annual Water System Quality: Consumer Confidence Report, http://cfpub.epa.gov/safewater/ccr/index.cfm Drinking Water Best Management Practices For Schools and Child Care Facilities Served by Municipal Water Systems, https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100HGM8.txt Drinking Water Contaminants – Standards and Regulations, http://water.epa.gov/drink/contaminants/
	Reducing lead exposure and responding to elevated lead levels	U.S. Environmental Protection Agency: Lead in drinking water at schools and childcare facilities tools and resources, https://www.epa.gov/dwreginfo/drinking-water-schools-and-childcare-facilities
	Cleaning bacteria (drinking water fountains and hot water tanks)	Drinking Water Best Management Practices for Schools and Child Care Facilities Served by Municipal Water Systems, http://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100HGM8.txt
Forms	New York State child care forms (all)	Child care forms, http://ocfs.ny.gov/main/documents/docschild care.asp
	Site evaluation and inspection	Connecticut: Property History Questionnaire for Child Care Center and Group Child Care Home Applicants, http://www.ct.gov/dph/lib/dph/daycare/pdf/property_history_questionnaire.pdf Connecticut: Environmental Issues Referral Form For Daycare Center Inspections, http://www.ct.gov/dph/lib/dph/environmental_health/eoha/pdf/environmental_issues_referral_form_for_inspections_june_30….pdf New York: Environmental Hazards Guidance Sheet, http://ocfs.ny.gov/main/Forms/Day_Care/OCFS-LDSS-7040 Environmental Hazards Guidance Sheet.pdf
Information child care programs and resources	Connecticut	SAFER Program, http://www.ct.gov/dph/safer Environmental Issues Referral Form For Daycare Center Inspections, http://www.ct.gov/dph/lib/dph/environmental_health/eoha/pdf/environmental_issues_referral_form_for_inspections_june_30….pdf Connecticut Property History Questionnaire for Child Care Center and Group Child Care Home Applicants, http://www.ct.gov/dph/lib/dph/daycare/pdf/property_history_questionnaire.pdf
	Nationwide	Child Care Aware, data on child care by state, http://childcareaware.org/resources/map/ ACF Data explorer for state profiles, https://childcareta.acf.hhs.gov/data#tab-ece-state-profiles
	New Jersey	Environmental Guidance for All Child Care Facilities and Educational facilities, http://www.state.nj.us/dep/dccrequest/
	New York	Environmental Hazards Guidance Sheet, http://ocfs.ny.gov/main/Forms/Day_Care/OCFS-LDSS-7040%20Environmental%20Hazards%20Guidance%20Sheet.pdf Division of Child Care Services, http://ocfs.ny.gov/main/childcare/default.asp Child Care Forms, http://ocfs.ny.gov/main/documents/docschild care.asp

Resource Topic	Sub Topic	Web Links
Topics not addressed directly in this manual	Children's Environmental Health and Child Care.	Children's Environmental Health Network http://cehn.org
	Sun exposure	Physical Activity and Limiting Screen Time, http://cfoc.nrckids.org/StandardView/3.1.3.2
	High-volume roadways (air pollution, traffic or pedestrian hazards, etc.)	Air Quality Index- A guide to Air Quality and Your Health, https://airnow.gov/index.cfm?action=aqi_brochure.index Air Now.gov Home Page with Forecast, https://airnow.gov/index.cfm?action=airnow.main Best Practices for Reducing Near-Road Air Pollution Exposure at Schools, https://www.epa.gov/schools/best-practices-reducing-near-road-air-pollution-exposure-schools
	Consumer products used in the ECE setting (cleaning products, art supplies, artificial turf, pressure-treated wood playscapes, etc.)	Information for Child Care Providers about Green Cleaning, http://www.epa.gov/child care/information-child-care-providers-about-green-cleaning Tips for Cleaning Child Care Facilities the Safe & Healthy Way, http://www.ct.gov/dph/lib/dph/daycare/pdf/Day_Care_FS.pdf Information for Child Care Providers about Green Cleaning, http://www.epa.gov/child care/information-child-care-providers-about-green-cleaning Tips for Cleaning Child Care Facilities the Safe & Healthy Way, http://www.ct.gov/dph/lib/dph/daycare/pdf/Day_Care_FS.pdf Formaldehyde from building furnishings, http://deohs.washington.edu/pehsu/?q=factsheets Information on cleaning products, www.CleaningforHealthySchools.org
	Maintenance issues and activities (mold and moisture, pesticide use, etc.)	Safety and injury, https://eclkc.ohs.acf.hhs.gov/school-readiness/article/safety-injury-prevention Mold, http://www.cdc.gov/mold/strats_fungal_growth.htm Mold, https://www.epa.gov/mold Mold, https://www.cdc.gov/niosh/topics/indoorenv/mold.html Pesticide factsheet, http://deohs.washington.edu/pehsu/?q=factsheets Pest control, http://www.epa.gov/safepestcontrol/dos-and-donts-pest-control Routine cleaning and maintenance for healthy schools, https://www.epa.gov/schools-healthy-buildings/overview-routine-cleaning-and-maintenance-healthy-school-environment
	Natural disasters (earthquakes, floods, heat, etc.)	Children's Environmental Health Network, Eco Healthy Child Care, http://cehn.org/our-work/eco-healthy-child-care/ Emergency preparedness, https://eclkc.ohs.acf.hhs.gov/safety-practices/article/emergency-preparedness-tip-sheets Natural disaster factsheets, http://deohs.washington.edu/pehsu/?q=factsheets
	Odor	ATSDR resource on addressing odors in the environment, http://www.atsdr.cdc.gov/odors

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APPENDIX B: SAFER CHILD CARE SITING PROGRAM FORMS

Environmental Issues Referral Form for Inspections of Day Care Centers and Group Day Care Homes

Name of Daycare Center _____

Name of Inspector _____ Date of Inspection _____

Address of Daycare Center _____

Instructions: If item is observed, check applicable box. Space is provided at the end of the form for any additional information you think would be helpful. Taking a photograph or making a simple sketch can be helpful. You do not need to complete this form if no items are observed.

1. Outdoor Property

The following items are visible at the property where the daycare center is located.

___ Metal Drums or Barrels

___ Old car/vehicle parts

___ Discarded White Goods (i.e., old appliances)

___ Construction and Demolition debris pile (e.g., bricks/concrete, wood, plaster/drywall, plumbing fixtures, roofing, glass, electrical wiring, piping, asphalt pavement, insulation).

___ Barn(s), farm machinery/equipment

2. Daycare Building(s)

The following are visible at the building within which the daycare center operates.

___ Loading dock, large delivery doors

___ Old Mill Building/Mill Complex

___ Old brick construction, resembles old factory building

___ Resembles funeral home

3. Adjacent Businesses

The following businesses are operating immediately adjacent to the child care center, and within the same building or building complex as the child care center. For example, if a child care center is located next door to a dry cleaner but the dry cleaner is in a separate building, do not check the box. If a daycare center is located within the same strip mall building complex as a nail salon/hair salon, but the nail salon is several (or more) doors away from the daycare center, do not check the box. However, if a child care center is next door to a nail salon/hair salon and within the same strip mall building, check the nail salon box.

___ Dry Cleaner

___ Nail Salon/Hair Salon

___ Auto Repair/Auto Painting Shop

___ Copy/Print Shop

For Office Use Only

Referred to Inspector Date:_____Ref. by: _____Rec'd by:_____

Inspector Follow-up Complete Date:_____

Follow-up comments:

_____

_____

_____

_____

Property History Questions for Child Care Center and Group Child Care Home Applicants

Please complete the form on the next page after reading the instructions on this page. This form collects information about how the property and buildings at your child care center or group child care home were used in the past. Some past uses such as agricultural or manufacturing/industrial could have left chemicals behind on the land or in the buildings. The information you provide will help the Department of Public Health identify whether residual chemicals may be present at your child care property and will help the Department ensure that actions are taken (if needed) to make the property safe. Please note that if you are Family Child Care Home applicant and your program will operate in a private residential structure, you do not need to complete this form. Please answer the questions on the next page to the best of your ability and go back in time as far as readily available information allows.

We strongly recommend that you talk with the following people to help you complete this questionnaire.

- Property Owner (if applicable)
- Local health department (LHD). For help finding your LHD: http://www.ct.gov/dph/cwp/view.asp?a=3123&q=397740
- Town Planner/Town Zoning Office
- Town Engineer/Town Building Department

Other resources that may be helpful to you:

- Town tax assessor
- Town land records
- Local fire marshal
- Local economic development agency

If you have questions about completing this form, please contact Sharee Rusnak of the CT Department of Public Health Environmental and Occupational Health Assessment Program at 860-509-7740 or sharee.rusnak@ct.gov. For answers to questions regarding child care licensing regulations, requirements and applications, call the Office of Early Childhood at 1-800-509-8045.

General Information

Applicant Name _____

Name of Child Care Center/Group Child Care Home _____

Child Care Center/Group Child Care Home Address _____

Property History Questions

1. Current owner of Child Care Center/Group Child Care Home property _____
2. Has the Child Care Center/Home ever gone through a SAFER referral before?

   ☐ YES ☐ NO ☐ UNKNOWN

   a. If yes, when and under what name_____
3. Child Care Center/Group Child Care Home building was constructed in what year? _____

4. Was the Child Care Center/Home land or buildings ever used in the past for any of the following?

- ☐ Dry Cleaner
- ☐ Gas Station
- ☐ Auto Repair/Auto Painting Shop
- ☐ Retail/Commercial
- ☐ Undeveloped
- ☐ Child Care
- ☐ Unknown
- ☐ Metal Plating
- ☐ Shooting Range
- ☐ Farming/Agriculture
- ☐ Landfill/Dump
- ☐ Hair Salon/Nail Salon
- ☐ Factory/Manufacturing/Industrial
- ☐ Funeral Home
- ☐ Other _____

5. For any past use boxes you check, provide additional information, to the best of your ability. Attach additional pages if providing information for more than one type of past use.

   a. Name of property owner _____

   b. Owned/operated during what years? _____

   c. Company/Business name _____

   d. If factory/manufacturing past use, describe the type of manufacturing/products manufactured. For any other past uses, provide details about the business, if known: _____

   _____

   _____

6. Have any of the following documents ever been prepared for the child care property?

- ☐ Phase I Environmental Site Assessment
- ☐ Phase II Environmental Site Assessment
- ☐ Phase III Environmental Site Assessment
- ☐ Unknown

If yes, are they available?

☐ YES ☐ NO ☐ UNKNOWN

7. Have you seen anything on your day care property that makes you think that hazardous chemicals could have been used there in the past? For example, metal barrels or drums, discarded car parts, construction debris, farm equipment?

☐ YES ☐ NO ☐ UNKNOWN

If Yes, please provide further details _____ _____

_____

_____

_____

Example Connecticut Private Well Testing Letter

Dear XXXX XXXX,

We are contacting you with important information about testing the drinking water at your family or group child care home to ensure that it is safe from harmful chemicals. If your child care's drinking water comes from your own private well, please continue reading to learn more about well testing.

If your child care is served by public drinking water, this letter does not apply to you because the safety of your water is regulated by the Department of Public Health's Drinking Water Section. How do you know if you have public water? If you (or the property owner or landlord) pay a water utility bill, you have public water. You also have public water if your child care has a well that is used daily by 25 or more people.

If your child care's drinking water comes from a private well, you should be aware of the water tests that are recommended to ensure that your water is safe from all the harmful chemicals that could be present. The enclosed Publication #24 provides a list of recommended tests for all private wells.

As you probably know, state regulations for child care facilities require basic testing of well water. Most likely, you would have tested your well water at the time you first applied for a child care license. Your water test was probably limited to taste and odor issues (such as iron, turbidity, pH, manganese, sodium, chloride), and sanitary issues (such as bacteria and nitrates/nitrites). If you are a group child care home, you are also required to test your water for lead every two years.

You should know that the basic water testing required by the child care licensing regulations does NOT cover all the harmful contaminants that could be present in your well water. Additionally, it is important to understand that water quality can change over time. The water test results from the sampling you did when you were first licensed may be different today.

Please read the enclosed publication about well testing. Table 1 in Publication # 24 lists water tests that are recommended for everyone with a private well. If you have never done the recommended tests, we strongly urge you to contact a state certified laboratory and arrange for testing. A list of state certified laboratories is enclosed.

Young children are especially sensitive to harmful health effects from contaminants in drinking water. This is because their bodies are rapidly growing and developing and because they drink more water relative to their body weight than adults.

The well water tests listed in Publication #24 are not required by regulation. However, they are very important, particularly if your water is consumed by young children at your child care facility. Testing is the only way to be sure your water is safe from all harmful chemicals.

We strongly encourage you to call our staff at the Department of Public Health who can answer your questions about well water testing, testing results, or water treatment. Please contact the Private Well Program at 860-509-7296 or visit their website at www.ct.gov/dph/privatewells to find more information about private wells.

Sincerely,
XXXXX XXXXX, Supervising Environmental Analyst
Connecticut Department of Public Health
Private Well Program

NEW YORK STATE
OFFICE OF CHILDREN AND FAMILY SERVICES

Environmental Hazards Guidance Sheet

Read this guidance sheet carefully before signing the Environmental Hazards Statement. The Statement will ask you a question concerning potential environmental/health hazards on or near the location at which you will provide child care. You will be asked to answer yes or no and sign the Statement. ***The information on this guidance sheet will help you answer the question accurately.***

All day care applicants and providers are responsible for providing a site which is free from any health risk posed by an environmental/ health hazard. Children in care need to be in the safest place possible.

What is an Environmental Hazard?

Environmental hazards are conditions that expose persons to dangerous substances, which can cause them increased risk of illness or injury. These hazards can be the result of chemicals used or stored at a location or a facility. The facility may be currently operating, or may even be closed. Environmental hazards also happen as a result of an accident or emergency event. Some environmental hazards are ongoing while others may have been corrected.

Exposure to harmful substances may increase the risk of illness or injury to a person now or in the future. The amount of harm caused to a person living at or near a hazard depends upon the length of time and/or the type of contact a person has with the hazard. Children can be more sensitive to environmental hazards due to their small size and developing bodies.

Path and Route of Exposure

Path

It is important to understand that harmful substances can affect you even if they are miles from your property. Harmful substances can and do move. Some of the ways they move are through the air, soil or underground water. The way a harmful substance moves from its original site to surrounding areas is known as the "path of exposure". This is a term you may hear in researching a hazard around your property. If you are reporting an environmental hazard and are told about a path of exposure you will need to include the information on part I of the Environmental Information Form.

Route

The term "route of exposure" refers to how people come into contact with the hazard or how it enters the body. Examples are:

- absorption through the skin,
- inhalation or breathing; and
- ingestion or eating

The path of exposure to the day care and the route of exposure need to be evaluated to determine if there are any dangers that need to be resolved.

Common Sources of Environmental Hazards That May Need Evaluation

- **Lead-based Paint**
  Old peeling or chipping lead-based paint, lead dust and soil with lead in it can cause a risk of serious health problems, especially to small children. Lead-based paint may be found in buildings built before 1978 (1960 in New York City). The Office of Children and Family Services (OCFS) recommends that all child care program sites constructed in whole or in part before 1978 (1960 in New York City) be assessed for lead hazards.
- **Radon**
  Radon is a natural gas sometimes found in indoor air. If your town or city is listed as a zone 1 radon site (list provided) and your home or building has not already been tested, must complete testing and resolve any identified problems before registration/licensing is completed. If your home or building has already been tested for radon levels, additional testing may not be necessary. An Office of Children and Family Services (OCFS) representative will work with you to determine if additional testing is required.
- **Gas Stations**
  Gas Stations that have had a recent oil or gasoline spill. (Gasoline stations are NOT generally an environmental hazard. Gas Stations should be considered environmental hazards **only** if you have been informed that the gasoline station has had a spill, has underground corroded tanks or a tank leak.)
- **Additional sources for hazards:**
  Dry cleaners, nail salons, vehicle repair shops or garages, paint shops, metal work and forging shops, chemical or pesticide storage warehouses, power plants, manufacturing plants, and incinerators. The hazardous chemicals that may be present at these sites are: perchloroethylene, methyl, methacrylate, petrochemicals, volatile organic compounds, PCB, oils, solvents, glycol, and/or hydrocarbons.
- **Further hazards Include:**
  Hazardous waste sites, municipal landfills, junkyards, superfund sites (including brownfields, voluntary cleanup program sites, and state and federal superfund sites). The harmful substances that may be at these sites are: toxins, volatile organics metals and/or leachate.

In addition to the list of examples above, there may be other environmental hazards that can cause harm or injury. If you have a concern about a specific situation, refer to the hazards listed on the Environmental Hazards Primary Contacts chart and call the agency listed for help. You may also contact the Bureau of Early Childhood Services in your area of the state for further assistance. Regional office phone numbers are found under Resource and Agency Oversight listing at our website: www.ocfs.state.ny.us/main/becs.

Use the information on this Guidance Sheet as a resource to answer any question on The Environmental Statement.

ENVIRONMENTAL HAZARDS PRIMARY CONTACTS

HAZARDOUS WASTE SITES

HAZARD GROUPS	CONTAMINANT(S)	AGENCY AND CONTACT NUMBERS
Superfund, air strippers, foundries, volunteer cleanup sites, brownfields	Toxics, volatile organics, metals	*List agencies and their contact numbers here.*
Landfills	Leachate	*List agencies and their contact numbers here.*

INDUSTRIAL/COMMERCIAL DISCHARGES

HAZARD GROUPS	CONTAMINANT(S)	AGENCY AND CONTACT NUMBERS
Cement plants, dry cleaners, emissions-plants, buildings, fumes, commercial gas station refueling, paint shops, photo lab, print shops, vehicle repair	Dust, perchloroethylene, gases, volatile organic compounds, petrochemicals	*List agencies and their contact numbers here.*
Crematories, Nail salons	Smoke, Methyl methacrylate	*List agencies and their contact numbers here.*

SPILLS

HAZARD GROUPS	CONTAMINANT(S)	AGENCY AND CONTACT NUMBERS
Gas stations, storage tanks, electrical switchyards, junkyards	Petroleum hydrocarbons, PCB oils, solvents, glycol	*List agencies and their contact numbers here.*

RADIATION

HAZARD GROUPS	CONTAMINANT(S)	AGENCY AND CONTACT NUMBERS
Radon** (Refer to Radon Zone 1 following pages for your area)	Radon	*List agencies and their contact numbers here.*
Nuclear reactor/storage	Spent fuel, radioactive waste	*List agencies and their contact numbers here.*

LOCALIZED HAZARDS ON SITE OR ADJACENT PROPERTY

HAZARD GROUPS	CONTAMINANT(S)	AGENCY AND CONTACT NUMBERS
Building toxins – if present and assessed a danger, needs immediate removal	Carbon monoxide, asbestos	*List agencies and their contact numbers here.*
Deteriorating paint	Lead	*List agencies and their contact numbers here.*
Building leaks	Fungi, bioaserosols, mycotoxins, mold	*List agencies and their contact numbers here.*
Chemicals Must be out of reach of children and used when children are not on the property; the exception to using cleaning products with caution during program or ventilation alleviated chemical danger.	Cleaning products, Paint Products, Poisons, Pool Supplies, Funeral Homes, Formaldehyde, Hobbies: using glue, wood working, taxidermy or any other activity using exposed chemicals.	*List agencies and their contact numbers here.*

APPENDIX C: ATSDR RISK COMMUNICATION FORMS

Message Map Template Example

Audience/Group: Families with children who were exposed to lead in soil at the child care facility.

Question/Issue: How can lead affect my child's health?

Key Message 1	Key Message 2	Key Message 3
Lead affects the development of children younger than 6.	Childhood lead poisoning causes learning and behavioral problems.	Lead poisoning is preventable.
Supporting Facts 1. Children's brains and bodies are still developing. 2. Children have been playing outside in bare soil. 3. Lead in soil can get into children's bodies when they put hands and toys with dirt on them in their mouths.	**Supporting Facts** 1. Children may have difficulty learning to read. 2. Children can have hearing and speech problems. 3. Children can have hearing and speech problems.	**Supporting Facts** 1. Test your child for lead. 2. Children should not play in bare soil on the playground. 3. Wash children's hands and toy's frequently.

Message Map Template Example

Audience/Group: Families with children who were exposed to lead in soil at the child care facility.

Question/Issue: How can lead affect my child's health?

Key Message 1	Key Message 2	Key Message 3
Supporting Facts 1. 2. 3.	Supporting Facts 1. 2. 3.	Supporting Facts 1. 2. 3.

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APPENDIX D: THE PENNSYLVANIA GEOGRAPHIC INFORMATION SYSTEM (GIS) PROGRAM

The Pennsylvania GIS Program

The Pennsylvania Department of Health, Bureau of Epidemiology, Environmental Health Epidemiology, Health Assessment Program has developed the following program to use geographic information system (GIS) information to determine the proximity of child care facilities to facilities that use or generate hazardous materials.

Sources of Data

- **Esri open source data**
  - http://www.esri.com
  - Topographic maps and rooftop aerials.
- **U.S. Environmental Protection Agency (EPA) Envirofacts**
  - http://www.epa.gov/enviro/facts/multisystem.html
  - Environmental sites: EPA brownfields, EPA National Priority List sites, and Toxic Release Inventory data.
  - Resource Conservation and Recovery Act of 1976 (RCRA) Small Quantity Generators (SQG): dry cleaners, print shops, machine shops, laboratories, and furniture manufacturing and restoration.
- **Pennsylvania Spatial Data Access (PASDA)**
  - http://www.pasda.psu.edu
  - Pennsylvania Department of Environmental Protection sites and facilities: land recycling/ brownfield sites, landfills, storage tank locations, air permit facilities, municipal waste generators, and Environmental Justice locations.
- **Pennsylvania Department of Public Welfare (PADPW)**
  - https://www.compass.state.pa.us/Compass.Web/Public/CMPHome
  - PADPW open child care facilities.
- **Department of Defense (DOD)**
  - https://rsgisias.crrel.usace.army.mil/publicfuds
  - Formerly used DOD sites.
- **Department of Energy (DOE)**
  - http://www.osti.gov/dataexplorer/
  - Formerly used DOE sites.
- **U.S. Census**
  - http://www.census.gov/geo/maps-data/index.html
  - Census maps and data, including block and census track locations
  - The American Community Survey — a yearly survey that provides information about our nation and its people.

Methodology

To determine the closeness of child care centers to environmental sites and RCRA small quantity generator (SQG) facilities, PADOH uses ArcGIS 10.0. The locations of the open child care facilities, environmental sites and EPA RCRA reporting facilities are geocoded by address or latitude and longitude coordinates in ArcGIS. Two analysis procedures are then performed in ArcGIS. The first is a "buffering" analysis that allows for setting a radius or buffer around the facilities. PADOH uses half the size of a typical city block (or 200 feet) to estimate the buffer distance from the SQG to a child care center. For other sites, including brownfields and NPL sites, PADOH uses an initial search buffer of 1/8 of mile. Next, an "intersect" analysis is performed to overlay the buffered child care locations with the environmental site data and SQG locations.

Based on these analyses, ArcGIS identifies a list of sites and facilities located within the search radius from the child care centers. For the SQG, the locations of co-located facilities are confirmed via ArcGIS rooftop mapping, to determine if the child care centers and waste generators potentially share a wall, and then by Google Street View. This additional step using Google Street View helps to determine if a facility was located across the street, on a different block or potentially sharing a wall as well as determining misidentifications [49].

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APPENDIX E: ESTIMATING POTENTIAL EXPOSURES FOR ECE PROGRAMS

ESTIMATING POTENTIAL EXPOSURES FOR ECE PROGRAMS

ATSDR's National Estimate of ECE Programs with Potential Harmful Exposures

ATSDR estimates that 1.35 million children are in programs that warrant additional evaluation to ensure the site is safe and about 174,000 children may currently be exposed to harmful contaminants.

Basis for Estimate

- The United States has approximately 110,000 licensed child care centers.
- As of March 2016, New Jersey had 3,939 licensed child care centers [8], of which 17% have had an actual or potential indoor air exposure concern because of the location of the center and 2.2% needed action to prevent or mitigate actual harmful exposures.
- New Jersey averages 72 children per licensed child care centers (based on the geometric average of all licensed childcares) [50].

Calculations

FOR CHILDREN AT SITES THAT WARRANT ADDITIONAL EVALUATION TO ENSURE THE SITE IS SAFE:

110,000 licensed child care centers in the United States **X** 17% of centers in New Jersey with actual/ potential exposure concern **=** 18,700 centers of potential concern in the United States.

18,700 centers of potential concern in the United States **X** 72 children per licensed child care center in New Jersey **=** ***1,346,400*** children in programs that warrant additional evaluation to ensure the site is safe

FOR CHILDREN AT SITES THAT MIGHT CURRENTLY BE EXPOSED TO HARMFUL CONTAMINANTS:

110,000 licensed child care centers in the United States **X** 2.2% of centers in New Jersey needing action to prevent or mitigate actual harmful exposures **=** 2,420 centers of potential concern in the United States.

2,420 centers of potential concern in the United States **X** 72 children per licensed child care center in New Jersey **=** ***174,240*** children may currently be exposed to harmful contaminants.

	Warrant additional evaluation to ensure the site is safe	May currently be exposed to harmful contaminants
Children (estimated number)	1,346,400	174,240
ECE programs (estimated number)	18,700	2,420

Limitations and Notes

New Jersey is only one state. The composition of urban, suburban, and rural areas and the legacy of past contamination and current business patterns might not represent all of the United States.

Sufficient data from other states are not available to use to calculate a potential national estimate. Therefore, this calculation provides a starting point and needs to be interpreted carefully.

The number of child care centers (110,309) might exclude places such as Head Starts, preschools, or other licensed programs. The document the number was obtained from only lists licensed child care centers. Therefore, our calculation might underrepresent the number of programs and children at risk.

The data provided by New Jersey's program focuses on indoor air exposures, and does not capture soil contamination which falls under the jurisdiction of the NJ Department of Environmental Protection. Using this data might under-represent exposures from soil, outdoor air, or other sources.

New Jersey's program also focuses on licensed ECE programs where more than five children are in care, making the focus on larger programs. This might not reflect how children are cared for outside of their home across the United States. ATSDR will update these burden estimates when data from other states are available.

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APPENDIX F. ACTIVITIES OF CONCERN WITH FORMER OR ADJACENT USES TO A SITE

Activities of concern with former or adjacent uses to a site

Activity	Concerns if activity occurred on the ECE site	Concerns if activity is nearby the ECE	Possible chemical contaminants[22]
Airports	Possible soil, surface water, runoff, or groundwater contamination from activities on site, such as use of firefighting foam. Vapor intrusion from contamination in soil or groundwater plumes.	Possible soil, surface water, runoff, or groundwater contamination from activities on site, such as use of firefighting foam. Chemical contaminants can migrate off site if environmental conditions move soil, surface water, or groundwater onto the ECE site. Contaminated groundwater can contaminate indoor air by vapor intrusion.	Trichloroethylene (TCE), jet fuel, perfluoroalkyl substances (PFAS) including perfluorooctanoic (PFOA) and perfluorooctane sulfonic acid (PFOS)
Automobile crushing	Possible soil, surface water, or groundwater contamination from activities on site. Vapor intrusion from contamination in soil or groundwater plumes.	Possible soil, surface water, or groundwater contamination from hazardous materials on site. Chemical contaminants can migrate off site if environmental conditions move soil, surface water, or groundwater onto the ECE site. Contaminated groundwater can contaminate indoor air by vapor intrusion.	Polycyclic aromatic hydrocarbons (PAHs), mercury, volatile organic compounds (VOCs), lead
Automotive repair	Soil, surface water, or groundwater contamination from improper use, storage, handling, or disposal of hazardous materials or products. Vapor intrusion from contamination in soil or groundwater plumes.	Possible soil, surface water, or groundwater contamination from hazardous materials that were on site. Chemical contaminants can migrate off site if environmental conditions move soil, surface water, or groundwater onto the ECE program site. Contaminated groundwater can contaminate indoor air by vapor intrusion.	Lead, PAHs, petroleum, perchloroethylene (PCE), TCE, and benzene, toluene, ethylbenzene, and xylenes (BTEX)
Bus terminal or truck transfer station (active)	Unlikely ECE program would be on an active transfer station site.	High volume of diesel engines could create large amount of particulate matter in the air.	Particulate matter (PM)
Chemical production	Possible soil, surface water, or groundwater contamination from hazardous materials that were on site. Vapor intrusion from contamination in soil or groundwater plumes.	Possible soil, surface water, or groundwater contamination from hazardous materials on site. Chemical contaminants can migrate off site if environmental conditions move soil, surface water, or groundwater onto the ECE site. Contaminated groundwater can contaminate indoor air by vapor intrusion.	VOCs, PAHs, metals

[22] For information on the potential health effects of exposure to many of these contaminants, see ATSDR ToxFAQs at: http://www.atsdr.cdc.gov/toxfaqs/index.asp

Activity	Concerns if activity occurred on the ECE site	Concerns if activity is nearby the ECE	Possible chemical contaminants[22]
Coal gasification	Soil, surface water, or groundwater contamination from hazardous materials used or disposed of on site. Vapor intrusion from contamination in soil or groundwater plumes.	Possible exposure to wind-blown dust.	PAHs, VOCs, lead, cyanide compounds
Concentrated animal feeding operations	Unlikely ECE program would be on an active concentrated animal feeding operation site.	When thousands of animals are in one space they create a large amount of animal waste. This waste can contaminate water. Salts from large amounts of manure can also pollute groundwater.	Nitrates, salts
Dump, landfill, or filled wetland (former)	Possible soil, surface water, or groundwater contamination from hazardous materials placed in landfill or from activities on the site. Indoor air contamination from vapor intrusion.	Possible soil, surface water, or groundwater contamination from hazardous materials place in landfill or from activities on the site. Indoor air contamination from vapor intrusion.	VOCs, PAHs, mercury, lead, polychlorinated biphenyls (PCBs), metals
Dumping (any illegal)	Possible soil, surface water, or groundwater contamination from hazardous materials placed in landfill or from activities that happened on the site. Vapor intrusion from contamination in soil or groundwater plumes.	Possible soil, surface water, or groundwater contamination from hazardous materials on site. These chemical contaminants can migrate off site if environmental conditions move soil, surface water, or groundwater onto the ECE site. Contaminated groundwater can contaminate indoor air by vapor intrusion.	VOCs, PAHs, mercury, lead, PCBs, asbestos, other dumped chemicals
Dry cleaner	Soil or groundwater contamination from improper disposal of dry cleaning solvents. Vapor intrusion issues for any structures on site.	Chemicals used in dry cleaning can contaminate the air. Shared HVAC systems can increase the chance that chemicals from an active business could contaminate air within a nearby ECE program. Chemicals from a dry cleaning business that is active or closed can also contaminate soil and groundwater if chemicals were not properly handled on site. Chemicals in soil or groundwater might then enter indoor space through vapor intrusion.	PCE, TCE

Activity	Concerns if activity occurred on the ECE site	Concerns if activity is nearby the ECE	Possible chemical contaminants[22]
Electronics manufacturing/ recycling	Soil, surface water, or groundwater contamination from hazardous materials that were on site. Improper handling or storage of chemicals such as degreasers. Vapor intrusion can result from contamination in soil or groundwater plumes.	Improper handling or storage of chemicals such as degreasers can potentially migrate off site if environmental conditions move soil, surface water, or groundwater onto the ECE program site. Contaminated groundwater can contaminate indoor air by vapor intrusion.	VOCs, PCBs, metals, PAHs, TCE, PCE
Factory, manufacturing, or industry work (former)	Soil and groundwater could be contaminated from past use of the site and improper storage or disposal of chemicals. Inside building could be contaminated with mercury (used in thermometers or lamps) or other chemicals that would remain inside long after manufacturing was completed.	Possible soil, surface water, or groundwater contamination from hazardous materials on site. These chemical contaminants can migrate off site if environmental conditions move soil, surface water, or groundwater onto the ECE site. Contaminated groundwater can contaminate indoor air by vapor intrusion.	Mercury, lead and other metals, VOCs, PAHs, asbestos, PCBs, PFAS
Firefighting training	Possible soil, surface water, or groundwater contamination from firefighting foam.	Possible soil, surface water, or groundwater contamination from hazardous materials on site. These chemical contaminants can migrate off site if environmental conditions move soil, surface water, or groundwater onto the ECE site. Contaminated groundwater can contaminate indoor air by vapor intrusion.	PFAS
Funeral homes	Possible indoor air contamination from chemicals used within the funeral home if an original building is being used.	Contamination from nearby site less likely concern because potential contamination from practices are likely inside a structure.	Formaldehyde
Gas station	Soil or groundwater contamination from leaking storage tanks. This contamination could also lead to vapor intrusion issues for any structures on site.	Spills of petroleum or degreasers could contaminate soil, surface water, or groundwater. These chemical contaminants can migrate off site if environmental conditions move soil, surface water, or groundwater onto the ECE site. Contaminated groundwater can contaminate indoor air by vapor intrusion.	VOCs, lead, PAHs, BTEX

Activity	Concerns if activity occurred on the ECE site	Concerns if activity is nearby the ECE	Possible chemical contaminants[22]
Industrial manufacturing	Soil, surface water, or groundwater contamination from hazardous materials used or disposed of on site. Possible indoor contamination from past manufacturing.	Possible soil, surface water, or groundwater contamination from hazardous materials used or disposed of on site. These chemical contaminants can migrate off site if environmental conditions move soil, surface water, or groundwater onto the ECE program site. Contaminated groundwater can contaminate indoor air by vapor intrusion.	VOCs, PCBs, metals, PFAS including PFOA and PFOS, and other chemicals depending on manufacturing
Junk yard	Possible soil, surface water, or groundwater contamination from hazardous materials on site or from activities that happened on the site. Physical hazards.	Possible soil, surface water, or groundwater contamination from hazardous materials on site. These chemical contaminants can migrate off site if environmental conditions move soil, surface water, or groundwater onto the ECE site. Contaminated groundwater can contaminate indoor air by vapor intrusion.	VOCs, PAHs, mercury, lead, PCBs, metals, asbestos
Laboratories or research facilities	Possible indoor air contamination from hazardous materials used within laboratory buildings if original buildings are being used. Possible soil, surface water, or groundwater contamination from hazardous materials that were on site. Vapor intrusion from contamination in soil or groundwater plumes.	These chemical contaminants can migrate off site if environmental conditions move soil, surface water, or groundwater onto the ECE program care site. Contaminated groundwater can contaminate indoor air by vapor intrusion.	Mercury, VOCs, PAHs, metals, TCE
Manufactured gas plant	Possible soil, surface water, or groundwater contamination from activities on site.	Possible soil, surface water, or groundwater contamination from activities on site. These chemical contaminants can migrate off site if environmental conditions move soil, surface water, or groundwater onto the ECE site.	PAHs, metals
Medical or dental clinic	Possible indoor air contamination from hazardous materials used within the clinic if an original building is being used.	Contamination from nearby site less likely concern since potential contamination from practices are likely inside a structure.	Mercury, chemotherapy agents

Activity	Concerns if activity occurred on the ECE site	Concerns if activity is nearby the ECE	Possible chemical contaminants[22]
Metal recycling	Possible soil, surface water, or groundwater contamination from activities on site. Vapor intrusion from contamination in soil or groundwater plumes.	Possible soil, surface water, or groundwater contamination from activities on site. These chemical contaminants can migrate off site if environmental conditions move soil, surface water, or groundwater onto the ECE site.	Lead, mercury, PAHs, VOCs
Meth Lab (clandestine drug lab)	Possible contamination of indoor spaces and chemical improperly handled or dumped on site.	Contamination from nearby site less likely concern since contamination from a clandestine drug lab are likely inside a structure.	Acids, bases, pharmaceuticals, illegal drugs
Military installations	Possible soil, surface water, runoff, or groundwater contamination from activities on site. Vapor intrusion from soil or groundwater plumes.	Possible soil, surface water, runoff, or groundwater contamination from activities on site. Vapor intrusion from soil or groundwater plumes.	Solvents, petroleum, BTEX, radionuclides
Mill buildings (formerly used for manufacturing)	Indoor contamination from past manufacturing. Outside soil, surface water, or groundwater contamination from past use or disposal of hazardous materials. Possible exposure to wind-blown dust.	Possible exposure to wind-blown dust. Contaminated ground water could migrate off site and cause an indoor air contamination from vapor intrusion.	VOCs, mercury, lead, arsenic, PCBs, metals, asbestos
Mines or abandoned mine sites	Soil, surface water, or groundwater contamination from mine tailings and waste rock.	Possible soil, surface water, or groundwater contamination from mine tailings and waste rock. These chemical contaminants can migrate off site if environmental conditions move soil, surface water, or groundwater onto the ECE site.	Metals, radioactive mine waste
Nail, hair or beauty salon	Chemicals used in these businesses are more likely to be a concern if business is adjacent to an ECE program.	Chemicals used in nail and beauty salons can contaminate air. Shared HVAC systems can increase the chance that chemicals from an active business could contaminate the air within a nearby ECE program.	Toluene, Dibutyl phthalate, Formaldehyde, Methyl ethyl ketone (MEK), Ethyl or butyl acetate, Methyl methacrylate
Orchards or agricultural use	Possible soil or groundwater contamination from pesticide use.	Spray from pesticide application can drift off site onto nearby sites. Wind or rain may cause contaminated soil to move onto the ECE program site. Contaminated ground or surface water could also impact drinking water wells. Many fertilizers contain forms of nitrogen that can break down into harmful nitrates.	Arsenic, pesticides

Activity	Concerns if activity occurred on the ECE site	Concerns if activity is nearby the ECE	Possible chemical contaminants[22]
Plating facility	Soil, surface water, or groundwater contamination from hazardous materials improperly used, stored, or disposed on site.	Improper handling or storage of chemicals can potentially migrate off site if environmental conditions move soil, surface water, or groundwater onto the ECE program site.	VOCs, PCBs, metals
Pipelines	Aging pipelines may pose a risk if leaks occur.	Aging pipelines may pose a risk if leaks occur.	Natural gas pipelines transport natural gas. Liquid petroleum (oil) pipelines transport liquid petroleum and some liquefied gases, including carbon dioxide. Liquid petroleum includes crude oil and refined products made from crude oil, such as gasoline, home heating oil, diesel fuel, aviation gasoline, jet fuels, and kerosene. Liquefied ethylene, propane, and butane, are also transported through oil pipelines.
Railroad station/ transfer station (active)	Unlikely an ECE program would be on an active transfer station site.	High volume of diesel engines could create large amount of particulate matter in the air.	PM
Shooting range, gun club	Possible soil contamination from discharge of thousands of rounds of ammunition.	Possible soil contamination from discharge of thousands of rounds of ammunition. Contaminants can migrate off site if environmental conditions move soil or surface water onto the ECE program site.	Lead, arsenic, PAHs
Storage of any hazardous materials	Possible soil or groundwater contamination from the hazardous materials that were on site. Vapor intrusion from contamination in soil or groundwater plumes.	Possible soil, surface water, or groundwater contamination from hazardous materials on site. These chemical contaminants can migrate off site if environmental conditions move soil, surface water, or groundwater onto the ECE site. Contaminated groundwater can contaminate indoor air by vapor intrusion.	Dependent on past use

Activity	Concerns if activity occurred on the ECE site	Concerns if activity is nearby the ECE	Possible chemical contaminants[22]
Tire storage or dumping	Possible soil, surface water, or groundwater contamination from the storage or breakdown of tires.	Possible soil, surface water, or groundwater contamination from the storage or breakdown of tires.	VOCs, PAHs, mercury, lead
Waste transfer or recycling stations	Possible soil, surface water, or groundwater contamination from hazardous materials on site or from activities that happened on the site. Vapor intrusion from contamination in soil or groundwater plumes.	Active recycling or transfer stations might have soil contamination or generate dust that could bring contamination from the site onto a nearby daycare. Possible soil, surface water, or groundwater contamination from hazardous materials on site. These chemicals can migrate off site if environmental conditions move soil, surface water, or groundwater onto the ECE program site. Contaminated groundwater can contaminate indoor air by vapor intrusion.	VOCs, PAHs, mercury, lead, PCBs, metals
Underground storage tanks (known or suspected)	Soil or groundwater contamination from leaking storage tanks. Possible indoor air contamination from vapor intrusion.	A leaking nearby tank could cause possible indoor air contamination from vapor intrusion.	VOCs, petroleum, BTEX

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