

APPENDIX C
EXAMPLES OF INSTITUTIONAL CONTROLS

C-1. Introduction. Institutional controls are mechanisms that protect property owners and the local community from residual risk on a property contaminated by OE. As discussed in Chapter 2, institutional controls include legal mechanisms, engineering controls and educational controls. This appendix provides more detailed information on these types of institutional controls. In particular, the strengths and limitations for each type of institutional control are discussed.

C-2. Legal Mechanisms. Legal mechanisms are categorized into two broad areas: proprietary controls and local government controls. The types of legal mechanisms are outlined in Table C.1 and are discussed below.

a. Proprietary Controls. Proprietary controls are those institutional controls that are associated with ownership of the land and therefore, often included in the deed for the land. Proprietary controls are classified as either nonpossessory or possessory controls.

Table C.1 Legal Mechanisms	
Proprietary Controls	<p>Nonpossessory Controls</p> <ul style="list-style-type: none"> • Easements <ul style="list-style-type: none"> – Appurtenant Easement – Gross Easement – Affirmative Easement – Negative Easement – Statutory Easement • Restrictive Covenants • Reversionary Interests <p>Possessory Controls</p> <ul style="list-style-type: none"> • Property Ownership • Limited Partnerships
Local Government Controls	<p>Zoning Restrictions</p> <p>Permit Programs</p> <p>Siting Restrictions</p> <p>Overlay Zoning</p>

(1) **Nonpossessory Proprietary Controls.** Nonpossessory proprietary controls means the holder of these interests has a right to use or restrict use of a piece of land, but does not have the right to actually possess it. Examples of this type of control include easements, restrictive covenants, and reversionary interests.

(a) **Easements.** The most common nonpossessory proprietary control is known as an easement. An easement is an interest in a piece of land that entitles its holder to use the land or restrict the use of the land owned by another. Easements may be categorized as appurtenant or gross; affirmative or negative; or statutory.

- **Appurtenant Easement.** An easement is considered appurtenant if the holder is the owner of nearby land which benefits from the easement. For example, this occurs when a neighbor is allowed to walk across another person's property to access the beach.
- **Gross Easement.** A gross easement is one in which the holder, usually a company or public entity, does not own the land, but has the ability to use it. For example, this occurs when a gas company is allowed to lay a gas line on another person's property.
- An affirmative easement allows the holder of the easement to use the land in a way that otherwise they could not. This is the most common type of easement. An example of an affirmative easement is, again, the gas company that has the ability to lay a gas line on another person's property.
- A negative easement prohibits the use of the land in a manner that would otherwise be legal. An example of a negative easement is the owner of a hazardous waste landfill who is prohibited from developing the property for another use because of the current use of the site.
- Some states have developed statutory easements, including conservation easements, which restrict the property use to one that is compatible with conservation of the environment or scenery. In the particular case of sites contaminated with OE, an easement may be enacted that would restrict the new property owner to land uses that are compatible with the level of OE clearance performed during the removal action. Easements have been used under CERCLA Section 120(h) to ensure that the federal government has access to a site to conduct additional response actions or to perform any necessary operations and maintenance (O&M) at a site that is undergoing active remediation of residual contamination.

(b) **Strengths and Limitations of Easements**

- As with all proprietary controls, the effectiveness of an easement to control appropriate use of a property containing residual contamination is dependent on the compliance of

the property owner with the easement. Generally, only the holder of an easement has the power to enforce compliance with the terms of the easement. This requires that the holder remain aware of activities at the property and is kept informed of any proposed changes in use of the property. If the holder of the easement (e.g., DOD) does not act on a land use violation once it has been identified, third parties (such as local or county governments) do not have the authority to enforce the easement.

- In the case of OE-contaminated sites where DOD may be the holder of an easement, but may not have a continuing local presence, periodic site visits would be required to assure that the property owner complies with the easement. If the holder of the easement does act, but the courts conclude that the action was not timely, it may be deemed that the holder of the easement forfeited its rights under the easement. Generally, however, equitable defenses such as laches, waiver and estoppel (which limit the timeframe within which enforcement must occur) typically do not apply to the federal government as they would to private entities. Even so, site visits should be conducted at predetermined intervals (e.g., annually, semi-annually, every three years, etc.) so that any violations can be addressed in a timely manner to ensure public safety.

(c) Restrictive Covenants. A restrictive covenant, which is also known as a deed restriction, is commonly used by the federal government to prohibit certain types of development, use, or construction on a piece of land where residual contamination does not allow unrestricted use of the property. Under a restrictive covenant, the government can usually take legal action to enforce the restriction if the new property owner does not abide with the development restrictions imposed at the time of sale or lease. A restrictive covenant may be either affirmative or negative. An example of an affirmative restrictive covenant is the landowner is required to do something that he/she would otherwise not be required to do. An example of a negative restrictive covenant is landowner may not do something that he/she is otherwise normally free to do.

(d) Strengths and Limitations of Restrictive Covenants. One advantage of restrictive covenants over easements is the flexibility to apply restrictions not only to an individual plot of land, but also to an entire area. Restrictive covenants tend to be a less desirable method of control than easements. Restrictive covenants have been controversial in the past because many were intended to maintain elite neighborhoods and viewed to be racist in their intent. For this reason, many restrictive covenants have been removed by judicial order. In addition, the variability of state property laws tends to be greater for restrictive covenants than for easements, making them more difficult to administer. In general, a covenant does not give the holder the right to enter and inspect the property to ensure that the owner is complying with the covenant. Therefore, an easement or some other agreement should also be agreed upon at the time a covenant is implemented as an institutional control.

(e) Reversionary Interests. This type of proprietary control is also known as “future estates”. The deed establishes certain conditions that would cause the property to revert back to the original owner if the conditions cited in the reversionary interest are violated. As such, this type of institutional control is like an easement, but with the added provision that if the terms of the institutional control are violated, the property will revert back to the original owner (the holder of the reversionary interest). The existence of a reversionary interest does not, in itself, prevent incompatible land uses, but it does provide the means for stopping the incompatible activities by reverting ownership rights to the original owner if a violation were to occur. Reversionary interests have been effectively used in the past to control future land use on sites that contain environmental contamination.

(f) Strengths and Limitations of Reversionary Interests. Reversionary interests have been used effectively in the environmental context to control land uses. Reversionary interests held by the government can last a very long time because equitable defenses such as laches, waiver and estoppel typically do not apply to the Federal Government as they would to private entities or individuals. Thus, although a reversionary interest does not prevent inappropriate use of a property, it can serve to halt such activities by reacquisition of the land by the holder of the reversionary interest.

(2) Possessory Proprietary Controls. A possessory proprietary control means that the holder of the control retains either a full or partial interest in the future use of the land. Such controls can be achieved either by retaining ownership or by retaining a major share in a joint ownership of a property through a limited partnership with others. Such programs have been used both in the private sector, as well as by the government, where the holder of the possessory proprietary control wishes to retain some say in the future use of a property without having the responsibility of complete and total ownership. Limited partnerships are an example of a possessory proprietary control that has been used in the past to limit future land use.

(3) Strengths and Limitations of Proprietary Controls. The administrative structure and support staff is usually already in place to enforce the control (although additional funding may be required). A potential limitation of proprietary controls is that their enforceability is governed by state property laws. This presents a difficulty common to all proprietary controls in that property laws vary widely from state to state. Therefore, the specific laws of the state in which the site is located must be carefully reviewed when using these mechanisms as an institutional control. Particular attention should be paid to the state’s requirements for creating a restriction that is enforceable and binding on both present and future owners and users. Currently only 16 states require that deed records used in proving title include information regarding certain conditions involving hazardous wastes or substances on a site (e.g., sites that had hazardous waste permits or are on the state hazardous waste site inventory). However, since most transfers of land are accompanied by a due diligence title search by an attorney or lending institution, a deed restriction may provide an effective notice to a potential buyer. Even if a potential owner chooses to ignore this notice and decides to proceed with the purchase of the

property, with the intention to develop it inappropriately, the lending institution approached for financing the project may have a greater incentive to ensure that the planned use is compatible.

(4) Proprietary controls require periodic site visits to assess whether the land use restrictions are being obeyed. To increase the effectiveness of proprietary controls at OE sites, it is necessary to agree at the time that the restriction is placed in the deed what third party, such as a local government or state agency, is responsible for performing the site visits and enforcing the institutional control. Again, the institutional control must be implemented in accordance with the specific property laws of the state in which the site is located. Additionally, government agencies and third parties must have an interest in and have the capability to monitor compliance with the restriction. Finally, it should be ensured when implementing the institutional control that all parties - USACE, local government, property owner, and property user - share the same interpretation of the restrictions at the time the legal mechanism is imposed so that there are no misunderstandings as to the development restrictions placed on the property.

b. Local Government Controls. Other types of legal institutional controls have evolved in the U.S. legal system to be reserved for use strictly by local government authorities. Local government controls provide potential avenues for the implementation of institutional controls at sites that are contaminated with OE. In the context of environmentally-contaminated sites, this group of land use controls is typically developed, implemented, and enforced through cooperative agreements negotiated between Potentially Responsible Parties (PRPs) and local and state government officials. The Federal Government (e.g., USEPA) has not historically asserted its authority under CERCLA to enforce such land use controls once they have been established. Controls on land use which local governments have the power to impose and enforce include zoning restrictions, permitting programs, siting restrictions, and overlay zoning.

(1) Zoning Restrictions. The primary method of locally controlling land use is through the development of zoning ordinances and community master plans. A typical zoning program geographically divides an area into zones with different regulations written to apply to each zone. The regulations vary between zones but apply equally to all properties within a zone. Generic zoning categories include residential, commercial, and industrial. The zoning restrictions that have been developed by the local zoning board are often posted in a master plan which lays out the type of use that is allowed in a particular area. Unfortunately, in most states master plans are not enforceable by law. Historically, the granting of variances to a local government's master plan has sometimes resulted in inappropriate land uses with regards to residual contamination on a site.

(2) Strengths and Limitations of Zoning Restrictions.

(a) Local zoning ordinances have the authority, based on state and local law, to restrict land use. However, no other area of U.S. law experiences the exceptional frequency of requests for amendments (e.g., rezoning) or revisions (e.g., variances and special exemptions) that is

common in the area of zoning ordinances. Although the rezoning process may be long, involving public notice, planning commission hearings, staff reports, governing body hearings, and public comment periods, it is the most common land use action taken by local government. This fact emphasizes the importance of buy-in on the part of the local government when using zoning as part of an institutional control program.

(b) One limitation with the use of zoning as an institutional control is the fact that local planning decisions are often driven by economic and political forces and often do not reflect the vision of a community. The local planning commission may be comprised of building contractors, real estate agents, and developers whose interests tend to be focused on deriving the highest economic value from a property with less attention given to the impact on human health and the environment.

(c) The Standard Act which has been used by many jurisdictions as the basis for local zoning programs was not designed to address many of today's land use issues. Many comprehensive plans were originally created as a reflection of existing land use patterns, not as a tool for planning future land use. Many local government bodies are therefore moving towards broad land use plans, describing land use objectives in words rather than maps. Whether a community continues to use master plans or develops general land use objectives, it must be recognized that they are most often advisory and do not carry the force of law.

(3) Permit Programs. Permit programs are another means that local governments have to limit land use. In establishing a permit program, the permitting agency determines specific conditions which must be met before a certain use or action is allowed on a property. Existing permit programs include building permits, water/sewer connection permits, and state well drilling permitting systems which have been developed to protect the quality and use of ground water. Permit programs have also been developed to help ensure that site developers are aware of and comply with special procedures that are required in the development of a parcel (for example, requiring a builder to replace the existing soil on a parcel because of its poor structural characteristics). Historically, permit programs have been developed in areas where special requirements are necessary to protect human health and the environment because of residual contamination that remains on a property. In the particular case of an OE-contaminated site, a permit program can be established that would require a developer to contact a UXO contractor approved by USAESCH to clear an area of OE prior to excavation for footings or foundations. Permitting programs provide an avenue by which both local authorities and USAESCH may become aware of land use activities that may not be compatible with the presence of OE. In order to maintain a successful permit program, a system to verify compliance with the permit program and the authority to bring violators back into compliance is required.

(4) Strengths and Limitations of Permit Programs. Permit programs are probably one of the easiest of the local governmental controls to implement. Permit programs are generally administered by a single local government entity and thus avoid regulatory confusion over

responsibility. A permitting system can effectively alert local officials to proposed land use changes that may be incompatible with site conditions or which may require special consideration to ensure safety. An effective system of administration is necessary in order to verify compliance with permitting conditions and to provide for enforcement to bring violators into compliance. Most localities, however, have a permitting system already in place that could be used to administer any specific restrictions at OE-contaminated sites.

(5) Siting Restrictions. Siting restrictions have historically been used to limit land use in areas subject to natural hazards such as earthquakes and floods. This type of control has also been used to protect natural resources from development (such as with the existing wetlands program). Existing programs which use siting restrictions include floodplain development laws administered by the USACE and the Federal Emergency Management Agency (FEMA). The floodplain management program involves insurance requirements in areas prone to flooding. In order for a community to be eligible for FEMA flood insurance, the local community must restrict floodplain development. As an incentive to limit development in flood prone areas, insurance premiums are tied to the probability of flooding. In addition, if development occurs within a restricted area, the entire community can lose its eligibility for insurance. This provides an incentive for those not living in the floodplain to take efforts to oppose floodplain development. Several states and local governments, also have substantial siting restrictions in place that limit the future development of properties within their jurisdiction.

(6) Strengths and Limitations of Siting Restrictions. Siting restrictions are useful in addressing large areas with similar hazards under one program. Generic siting restrictions could be developed to address the hazards common to all OE-contaminated sites, although site specific characteristics must also be considered on a case by case basis. The limitations of siting restrictions to control inappropriate development of sites are illustrated by the floodplain management program. FEMA's floodplain management restrictions have not succeeded in preventing flood damage for several reasons. First, development had already occurred in areas subject to flooding prior to the enactment of the restrictions. Secondly, local and federal interpretations of the restrictions are often different, resulting in development within restricted areas. The use of siting restrictions as an institutional control is also characterized by weaknesses similar to zoning. That is, the local planning commission may experience political or economic pressure from the community and local developers (who may be on the planning commission themselves) to allow development in restricted areas by granting variances.

(7) Overlay Zoning. Siting restrictions may be combined with local zoning ordinances or master plans to establish an effective institutional control. This practice is known as "overlay zoning". When using overlay zoning, the specific siting restriction is used as an overlay on the local government's master plan, thereby highlighting any discrepancies between the two. In the case of sites contaminated with OE, the location of the site may be identified on an overlay of the local zoning map or master plan. The overlay would serve to notify those involved in land use planning of the hazards and land use restrictions associated with the site.

(8) Strengths and Limitations of Overlay Zoning. Overlay zoning is a combination of local zoning ordinances and siting restrictions and therefore, it is characterized by a combination of the strengths and limitations discussed above for these two local governmental controls.

(9) Strengths and Limitations of Local Governmental Controls. One advantage of using local governmental controls such as zoning, building permits, siting restrictions, and overlay zoning in an institutional control program is that the administrative structure and support staff is usually already in place to enforce the control. In order to use local governmental controls as part of an institutional control program, the local authorities responsible for administering and enforcing the programs must be willing and knowledgeable participants in the development of the institutional control program. Achieving buy-in by local authorities is discussed in greater detail in other sections of this pamphlet. A potential limitation common to these types of controls is the need to balance the desire to derive the greatest economic value of a property with the need to protect the public from residual contamination. It is often difficult for local governments to limit land use due to some potential risk in the face of development that will create jobs and generate tax revenue, although the two are not necessarily mutually exclusive.

C-3. Engineering controls. Engineering controls are physical controls and include fences, posted signs, and soil caps.

a. Fences. Fences are probably the most obvious type of engineering control that has historically been used to limit the public's access to a site. Fences are used to restrict inadvertent public entry to a site that poses a threat to public health or safety. By providing access only at certain points, appropriate notice can be given to all users and uses incompatible with the existing site conditions may be avoided.

(1) Strengths and Limitations of Fences. Fences provide the most direct means of limiting incidental exposure to a contaminated site. They do not require a search of local land use records or permitting agencies to determine whether a site is safe to use. Another benefit to fencing is that local trespass laws allow for violators to be prosecuted. Fences and other physical barriers to access require routine inspection and maintenance in order to remain effective. The property owner's desires, funding for inspection and maintenance, existing use of the site and surrounding properties, and enforcement responsibilities should be considered before including a fence as part of an institutional control program.

b. Signs. Warning signs may also be used to give notice regarding the presence of hazards on a site. Signs can provide information regarding the nature of the hazard, how to avoid the hazard, and also provide a contact for additional information. Signs may be used to deter access to a site or to give notice so that inappropriate uses of the site are avoided. While signs may not provide the physical barrier that a fence does, a sign has the added benefit of providing information to the public on the nature of the hazard found at a site.

(1) Strengths and Limitations of Signs. As with fences, signs can provide a direct warning to the general public of the hazards associated with a site and are an effective means to warn anyone who comes to a contaminated site of the hazards associated with an area. Signs may provide sufficient public notice so that violators can be prosecuted under existing trespass laws. As with fences, signs require routine inspection and maintenance in order to remain effective. While not requiring as much maintenance as fences, signs do deteriorate over time and require upgrade and/or replacement. The positioning of signs is always a critical matter to ensure that they may be seen by a maximum number of people. A drawback of signs is that they do not stop anyone from entering a site, they only inform. The property owner's desires, existing use of the site and surrounding properties, funding for inspection and maintenance, and enforcement responsibilities should also be considered before being including signs as part of an institutional control program.

c. Soil Caps. Placing a cap on a contaminated site by covering it with concrete, asphalt, or clay has been proven to be an effective physical barrier to public exposure to certain types of residual contamination. Such an engineering control would have definite application for certain OE-contaminated sites, if the cap is combined with a restriction on any future excavation at the site. By combining the engineering control of the cap with the legal restriction of limiting future use, the risk of the public coming into contact with OE is virtually eliminated.

(1) Strengths and Limitations of Soil Caps. Soil caps can be a very effective measure to minimize exposure to OE. Soil caps can take on many forms and their presence does not necessarily mean that a site cannot have some beneficial use. For instance, installing a parking lot in an OE-contaminated area can provide a benefit to the local area as well as protect the local population from exposure to OE items. The integrity of the cap must be maintained through routine inspection and maintenance as well as through controls that restrict future excavation at the site. Maintenance of the cap could be the owner's responsibility, particularly if the presence of the cap enhances the development potential of a site.

C-4. Educational Controls. Educational controls include formal seminars and public notices.

a. Formal Education Programs. Educating the local community about the potential exposure risks associated with an OE-contaminated site may be done through a variety of methods. Formal education seminars may include periodic public education classes. The classes may be given to a number of different audiences including open public forums, local government and/or regulatory personnel, emergency response personnel, property owners, private developers and real estate agents, or even school children at the local schools. The training seminars would have to be tailored to meet the specific interests/concerns of the audience, but can be an effective method to "spread the word" as to the nature and extent of the hazards associated with OE and the precautions to be taken in the event that a person comes across an OE item. The training classes may either be provided by personnel knowledgeable in the specific conditions of the site or through the distribution of training videos to local civic organizations. In order to be

effective, educational efforts need to be continual so that people do not forget or become complacent about the hazards associated with OE, as well as to inform newcomers.

(1) Strengths and Limitations of Formal Education Programs. Seminars and training programs may be given to educate various segments of the local community. This may include informational seminars for schools, parent-teacher associations, local clubs, etc. and more formal training for local government and regulatory personnel, public safety personnel such as the local police and fire departments, emergency response teams, and local construction and development companies. These programs require time and money to prepare as well as cooperation from local groups to schedule the sessions. Formal educational programs should be repeated on a regular basis so that people do not forget or become complacent about the hazards associated with OE, as well as to reach newcomers to the area. Although these programs can be very effective at informing the public about potential dangers and how to avoid them, not all members of a community will attend these meetings. Therefore, additional institutional controls may be necessary at a site in order to provide sufficient risk reduction.

b. Public Notices. The local community can also be educated through the implementation of a wide-ranging public notice campaign that may include mass mailings of brochures, public service announcements on local radio or television stations, or periodic notices in local newspapers. This type of educational control will also serve to educate newcomers and visitors to the area. One method that has been used at sites with a high public turn-over is to notify any new people to the area once they have contacted the local utility to start a new service. Once the request for the new service has been received by the utility company, they may include in their initial mailing to the new customer a brochure outlining the site specific hazards and what should be done in the event of an emergency. Such programs have been successfully used by power companies that have nuclear power plants in areas that are highly developed.

(1) Strengths and Limitations of Public Notices. Public notices have the advantage of reaching a wide audience without requiring much effort on the part of the public (i.e., they do not have to take the initiative to attend a meeting to receive the information). Public notices may take the form of mass mailings, public service announcements on radio and television, and/or periodic notices in local newspapers. Recurring notices have the advantage of reaching newcomers or visitors to an area in addition to reminding long-time residents. A public notice campaign would require both initial and ongoing funding and administration. Using an existing system that is already in place can minimize the required funding and administration. An example of this would be providing recurring information in local utility bills.