



# The Use of Institutional Controls Under the RCRA Corrective Action Program

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## Objectives of the Module

- Define institutional controls (ICs)
- Identify when ICs are needed
- Discuss types of ICs used in Corrective Actions program
- Explain planning and analysis considerations
- Discuss how to implement ICs
- Address emerging issues surrounding the use of ICs

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### Notes:

- **Define institutional controls (IC):** This module will define ICs and discuss the role of ICs in remedies under the Resource Conservation and Recovery Act (RCRA). In particular, it will address the role of ICs in the RCRA corrective action program.
- **Identify when ICs are needed:** This module will identify the circumstances in which ICs are needed.
- **Discuss types of ICs used in Corrective Actions program**  
Discusses the **types of ICs** and their planning and analysis considerations during RCRA corrective action (RCA).
- **ICs are evaluated in the process of selecting a remedy:** This module will discuss the types of ICs and their planning and analysis considerations during RCRA corrective action (RCA). EPA continues to emphasize that the components of corrective action (for example, release assessment, RCRA facility investigation [RFI], corrective measures study [CMS], etc.) should not be viewed as isolated steps in a linear process. In EPA's experience, it is generally more efficient to focus data collection on the information needed to support an appropriate, implementable remedy, than to attempt to complete separate evaluations at each step (RFA, RFI, CMS, and corrective measures implementation [CMI]).
- **Discuss how to implement ICs:** This module will discuss how ICs are implemented, including the mechanisms for establishing, monitoring, and enforcing ICs.
- **Address emerging issues surrounding the use of ICs:** This module contains a brief discussion that focuses on key implementation issues involving the use of ICs at RCRA corrective action facilities. In particular, this discussion will address the issues related to establishing, monitoring, and enforcing ICs.



## Definition of Institutional Controls

- Not defined under federal hazardous waste program
- IC's are non-engineering measures that minimize the potential for exposure
- Examples of ICs
  - Land and resource use restrictions
  - Well drilling prohibitions/well use advisories
  - Building permits
  - So called “Deed restrictions\*” and deed notices
  - Zoning restrictions

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### Notes:

- **Not defined under federal hazardous waste program:** The phrase “institutional control” is not defined under the federal hazardous waste program (see Title 40 of the Code of Federal Regulations [CFR] 260.10), although some RCRA regulations describe the use of ICs\*\*. For example, regulations at 40 CFR 264.119 and 265.119 require ICs to be emplaced when a hazardous waste land disposal unit is closed (for example, these regulations require a notation on the deed to the property that indicates that the land has been used for the disposal of hazardous waste).
  - **ICs are non-engineering measures that minimize the potential for exposure:** Under EPA guidance (see the document, *Institutional Controls: A Site Manager's Guide to Identifying, Evaluating, and Selecting Institutional Controls at Superfund and RCRA Clean-ups, September 2000*), ICs are defined as non-engineering measures intended to affect human activities in such a way as to prevent or reduce exposure to hazardous constituents. ICs are distinct from physical engineering measures, such as treatment and containment systems or fences. For example, fences are engineering controls that must be physically maintained to be effective. Examples of ICs include land and resource use restrictions, so-called “deed restrictions” (for example, covenants), well drilling prohibitions, building permits, well use advisories, and deed notices necessary to inform or give notice that residual contamination may remain on site.
- \* Deed restriction is a phrase used to describe easements or other forms of ICs. It is not a traditional property law term, and generally should be avoided in the context of discussing the use of ICs for corrective action.
- \*\* Although the term “ICs” is not defined under RCRA regulations, a working definition of ICs is provided under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). Specifically, the preamble to the National Contingency Plan (NCP) refers to institutional controls as supplementary [non-engineering] controls to limit human activities at or near contaminated facilities to protect human health and the environment and assure continued effectiveness of the response action (see 55 Federal Register [FR] 8706).



## Types of Institutional Controls

- **Informational:** non-enforceable advisories
- **Proprietary:** legal tools based in real property laws that restrict or affect the use of property
- **Governmental:** restrictions by state or local governments
- **Enforcement and permitting tools:** controls implemented as part of the RCRA enforcement and permitting processes

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### Notes:

- **Informational:** Informational controls, such as deed notices or fishing advisories warn prospective buyers or users of the land of contamination or expected use restrictions. Such ICs typically are not legally enforceable. These types of ICs can be disregarded by anyone who subsequently buys or uses the property. Because of concerns over their enforceability, informational ICs are best used in conjunction with other ICs.
- **Proprietary:** Ownership of an interest in real property allows the owner to control the use of that property. The rights of property owners generally are defined by the property law of the state in which the property is located; therefore, it is crucial to identify and understand applicable property law when developing a proprietary IC. Some examples of proprietary ICs are easements and covenants.

**Instructor's Note:** *Tell the participants that proprietary ICs will be discussed later in this module.*

- **Governmental:** Governmental ICs, by definition, involve restrictions for which the imposition and enforcement generally are within the traditional power of state and local governments, rather than EPA or an authorized state environmental agency.

**Instructor's Note:** *If time allows, ask participants to give specific examples of governmental ICs. Write the answers on a flip chart. Potential responses include: water advisories, well use advisories and restrictions, prohibitions against the drilling of wells, requirements for well drilling, building permits, zoning ordinances, and other land use restrictions. Emphasize the roles of local and county governments, as well as state and federal governments in establishing, monitoring, and enforcing these ICs.*

- **Enforcement and permitting tools with IC components:** EPA under RCRA can enforce permit conditions or issue orders under the authority of sections 3008(a), 3004(u), 3004(v), 3008(h), or 7003. Permits and orders may include requirements that restrict the future land use at a site or that require the facility owner or operator to put in place additional long-term ICs. Similarly, under sections 104(j) and 106(a) of CERCLA, orders can be issued or negotiated to compel the land owner to limit certain activities at private or Federal sites. These tools may be used by site managers, but may also have significant shortcomings that should be thoroughly evaluated.



## Roles of ICs in Remedies

- ICs have two primary purposes
  - Minimize the potential for exposure
  - Protect the integrity of the remedy
- ICs should be considered during all stages of corrective action
- ICs can be used under both the RCRA corrective action and closure programs
- EPA expects use of ICs in remedies under RCRA to be consistent with their use under CERCLA in order to achieve consistency

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### Notes:

- **ICs have two primary purposes:** ICs are often used to minimize the potential for exposure to contaminants (for example, restrict residential development) and to protect the integrity of remedies (for example, restrict excavation of an engineered cap). ICs are vital elements of corrective measures because they simultaneously influence and supplement the physical component of the remedy to be implemented.
- **ICs should be considered during all stages of corrective action :** ICs can be used during all stages of corrective action and should be considered as part of the remedy.
- **ICs are used under both the RCRA corrective action and closure programs:** Cleanups under RCRA make use of ICs, most commonly in connection with facility-wide corrective action under a permit or order, and in the closure of regulated units (landfills, surface impoundments, waste piles, and land treatment units). With respect to the use of ICs under RCRA corrective action authorities, the May 1, 1996 Federal Register (61 FR 19448) states that “EPA expects to use institutional controls such as water and land use restrictions primarily to supplement engineering controls as appropriate for short- and long-term management to prevent or limit exposure to hazardous waste and constituents. EPA does not expect that ICs will often be the sole remedial action.”

In addition to the use of ICs for corrective action, RCRA closure regulations (for example, 40 CFR 264.119(b)(1)) specifically require a deed notice for units where waste is left in place. The owner or operator must “record, in accordance with state law, a notation on the deed to the facility property, that will in perpetuity notify any potential purchaser that the land had been used to manage hazardous wastes, and that its use is restricted under the closure regulations”.

- **EPA expects use of ICs in remedies under RCRA to be consistent with their use under CERCLA in order to achieve consistency of results:** In a notice published May 1, 1996, EPA stated that it is “committed to consistency of results between the RCRA corrective action and Superfund remedial programs”, and that expectations for corrective actions were based on those published in the CERCLA NCP. The NCP preamble (55 FR 8706-7) and NCP regulations at 40 CFR 300.430(a)(1)(iii)(D) contain the following expectations: “EPA expects to use ICs such as water use and deed restrictions to supplement engineering controls as appropriate for short and long-term management to prevent or limit exposure. The use of ICs shall not substitute for active response measures as the sole remedy unless such active measures are determined not be practicable, based on the balancing of trade-offs.”

ICs are commonly used because treatment and containment measures do not address risks entirely, so that the remedy must include restrictions on use to ensure that it is fully protective, or to prohibit activities that could damage an engineering remedy.

EPA expects to use ICs such as water and land use restrictions primarily to supplement engineering controls as appropriate in the short and long term to prevent or limit exposure to hazardous waste and constituents. EPA does not expect that ICs will often be the sole remedial action.



## Evaluating the Need for ICs in Remedies and When to Use ICs

- Timing of evaluation
  - During interim measures
  - During RCRA Facility Investigation (RFI)
  - During Corrective Measures Study (CMS)
  - During Corrective Measures
  - Implementation (CMI)
  - During post-closure
- When ICs need to be considered (discussion)

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### Notes:

- **Timing of evaluation:** The corrective action process is not meant to be a cleanup prescription but a range of activities which might be necessary at a corrective action facility. Program implementors should choose carefully among corrective action steps when developing facility specific work plans. Streamlining of corrective action is a RCRA program priority. Remedies that address the risks at a site should be considered during all phases of corrective action, including interim measures. The use of ICs should be evaluated as early as possible or at least at the RFI phase to consider their effectiveness and identify potential problems with their implementation. At the CMS phase, details that will contribute to the screening of remedial alternatives are being developed and analyzed. If any remedy under consideration does not provide for unlimited use of the property or unrestricted exposure to any remaining hazardous constituents, ICs will be necessary to meet the RCRA requirements for protecting human health and the environment. Corrective action site managers should be seriously evaluating the effectiveness and implementability of ICs as they relate to the remedies under consideration, no later than the beginning of the CMS.

- **When to use ICs**

**Instructor's Note:**

Lead the class through a brief discussion of appropriate uses of ICs. Ask the class participants the following questions. Write the participants' responses on a flip chart in the front of the room.

- Question: Can anyone in the class give any examples of where the use of ICs might be appropriate?  
Answer: ICs are appropriate in situations where clean-up standards are based on industrial land use, and therefore hazardous constituents will be left at the facility at concentrations that would be harmful to residential users of the property. In these situations, ICs may be used to preclude future use of the property for purposes such as parks, agricultural uses, or daycare centers.
- Question: Under what conditions might ICs be used to address groundwater or surface water contamination? What are some examples of ICs that may be used to address such contamination?  
Answer: ICs should be used for situations where groundwater or surface water will remain contaminated or above safe levels for an extended period of time. Groundwater restrictions may have to be placed on new well drilling to prevent use of groundwater for household purposes. Similarly, fish advisories or swimming restrictions may be needed to prevent consumption of contaminated fish or exposure to contaminated surface water or sediments.
- Question: Under what conditions might ICs be used for soil or subsurface contamination?  
Answer: ICs can be used where contamination in subsurface soils is left at high concentrations. For example, in some cases, it may be technically impracticable to excavate soil near or under structures or over a wide area. In these types of situations, restrictions may be placed on the property to prevent recontamination of surficial soils resulting from disturbance of subsurface soils.

In addition, ICs may be used where certain activities must be prohibited to preserve an engineered remedy. For example, a cap may be placed on a landfill to prevent direct exposure to hazardous constituents or to reduce infiltration of surface water into the waste in the landfill and associated generation of leachate. Restrictions may be necessary to prohibit activities (for example, golf or other recreational activities) that would degrade the cap.



## IC Tools - Typical Land Use Restrictions

- Informational devices
  - Deed notices
  - Records and community involvement
- Proprietary devices
  - Easement
  - Covenant
  - Other real property devices  
(reversionary interest, state statutes, conservation easements)

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### Notes:

- **Informational devices:** Efforts to provide better public information about risks from contamination at a site can serve as a form of IC, even if they do not involve legally enforceable restrictions. This category of devices may apply to all types of RCRA facilities, whether or not they are expected to transfer ownership. Examples of informational devices may include:
  - **Deed language and deed notices:** Typically, enforceable controls are not established simply by having a landowner enter a notation in the deed to the property. A deed is the document executed when one party conveys an interest in the property to another party. In such a transaction, the selling party may place restrictions on the future use of the property. However, a landowner may not impose restrictions on its own property later by unilaterally altering that deed; property law requires a conveyance of a property interest (such as an easement) from the landowner to another party for a restriction to be enforceable. Nor can restrictions be imposed simply by having the landowner record a notice in the land records, without a conveyance of rights to some other party. Even if a unilateral document were accepted for recording, the landowner who filed it could remove it at any time. At best, the filing of such a document might have some informational value similar to posting a sign on the premises.
    - Unenforceable “deed notices” may be used to alert those searching land records to important information about the property.
    - Including language in the deed for transfer is a good method of providing notice and generally will be an important part of any IC plan. Deed notices filed with land records provide a method of alerting records searchers of environmental conditions at a property (for example, the presence of a closed hazardous waste landfill). The legal instrument should cite relevant portions of the administrative record, regulations, and property transfer documents, and should also serve as a stand-alone explanation of the restriction. Deed language may also be described in the property transfer document (for example, a real estate contract).
    - Depending on state law, which may vary, and depending on the intentions of the parties to the original transaction and third parties who hold an interest in the land, deed transfer language can be structured to give enforcement rights to the previous owner and to those third parties. Deed restrictions implementing ICs should be structured to “run with the land”, in other words, remain in force despite changes in ownership. State laws with respect to this issue vary, and the enforceability of such use restrictions should be considered carefully in light of applicable state law in structuring deed language. In general, the more stakeholders that have authority to enforce such a use restriction, the more effective it will be as a method of control. In spite of any legal restrictions, such a use restriction maintains its importance as a form of notice.
  - **Records and Community Involvement:** Other available methods of providing notice about ICs are local planning and zoning maps, subdivision plats, and similar state records and registries. Community education such as public meetings, recurring notices in newspapers, and signs and fences also provide notice about ICs (signs and fences are engineered controls).
- **Proprietary devices:** Use restrictions in property transfer documents, such as easements and covenants, limit the use of property and are legally enforceable by the owner/seller against third parties or successors in interest. Proprietary ICs are somewhat complicated for RCRA corrective action because RCRA generally does not authorize EPA or an authorized state agency to acquire any interests in property. Therefore, most proprietary ICs used for RCRA corrective actions will require the involvement of third parties, such as state or local governments.
  - **Easement:** The most flexible and traditional property interest, an easement is a property right conveyed by a landowner to another party that gives the second party rights with regard to the first party’s land. Easements may be in the “affirmative” or the “negative.” An affirmative easement allows the holder of the easement to enter upon or use another’s property for a particular purpose. A negative easement imposes limits on how the landowner can use his or her own property. A negative easement might, for instance, prohibit a particular parcel from being developed for residential purposes. Negative easements are fully enforceable as long as the intent of the parties as to the nature and scope of the easement is clear. However, in many states, common law easements are not enforceable by third parties such as a state or local government.
  - **Covenant:** A covenant is a promise by one landowner to another, made in connection with a conveyance of property. Covenants are similar in many respects to easements, but covenants traditionally have been subject to a somewhat different set of formal requirements.
  - **Other real property devices that may be used with ICs:**
    - Reversionary interest. A reversionary interest is created when one landowner deeds property to another, but the deed specifies that the property is to revert to the original owner under specified conditions. The reversion clause is binding upon any subsequent purchaser.
    - State use restriction statutes. A number of states have enacted statutes that establish methods to restrict land use, specifically for contaminated property, that override the common law impediments to the long-term enforceability on real property interests.
    - Conservation easements. Conservation easements are statutes adopted by some states that established easements to conserve and protect natural resources. A conservation easement may be used to prohibit certain uses of a property. For example, a conservation easement may prevent construction at a parcel of land.



## IC Tools - Typical Land Use Restrictions (continued)

- Governmental controls
  - Federal, state, and local laws and regulations
  - Land use restrictions
  - Groundwater use restrictions
  - Advisories
  - State registries

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### Notes:

- **Government controls such as federal, state, and local laws and regulations** - RCRA and analogous state hazardous waste statutes provide federal and state regulators direct legal authority to protect human health and the environment, prevent releases, or control certain site activities. However, these statutes typically do not specifically address the establishment of ICs. In establishing ICs at facilities that are subject to corrective action, EPA or state environmental agencies often must rely on state and local governments that may be responsible through existing legal frameworks or regulatory programs for activities such as monitoring public health through public health statutes, authorizing zoning and land use plans, passing ordinances, and acting under established statewide environmental programs. Examples of governmental controls include the following:
  - **Land use restrictions:** Local governments can place prohibitions on activities that could be disruptive to engineered controls at a site. These restrictions can include zoning authority, specialized zoning tools (such as overlay districts, the planned unit development, and transferable development rights), local permits, and tailored ordinances. The disadvantages of these types of approaches are that due process and legislative processes are typically required before local governments can impose such controls.
  - **Groundwater use restrictions:** Groundwater use restrictions, such as permitting requirements for well drilling, are directed at limiting or prohibiting certain uses of groundwater. Application of these ICs generally depend on a state's groundwater ownership and use laws, which vary considerably between states.
  - **Advisories:** A publicly issued warning that provides notice to potential users of land, surface water, or groundwater of some existing or impending risk associated with the use of that land, surface water or groundwater.
  - **State registries of hazardous waste sites:** In certain states, legislation has established registries of hazardous waste sites. Such registries typically include a number of common elements that collectively can be used as ICs. These may include:
    - A list of hazardous waste sites in the state
    - Annual reports submitted to the legislature that summarize the status of each site on the registry
    - Notice with the deed to a site on the registry that the site is contaminated
    - A requirement that any person conveying title to the property on the registry disclose the fact that the property is on the registry



## IC Tools - Typical Land Use Restrictions (continued)

- Enforcement and Permitting Controls
  - ICs may be implemented through RCRA enforcement authorities or through permit conditions
    - Enforcement tools
      - Section 3008(h) of RCRA
      - Section 7003 of RCRA
    - Permitting tools
      - Section 3004(u) of RCRA
      - Section 3004(v) of RCRA

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### Notes:

- **ICs may be implemented through RCRA enforcement authorities or through permit conditions:** Corrective action project managers may require the use of ICs through enforcement mechanisms (for example, corrective action orders) or through the RCRA permitting process.
- **Enforcement tools:** Enforcement tools include those available under Section 3008(h) of RCRA and the imminent hazard authority under Section 7003 of RCRA. In cases where the use of an IC is meant to continue beyond the expiration of a permit, an order may be required to ensure that the IC remains in effect for as long as necessary to protect human health and the environment.
- **Permitting tools:** Section 3004(u) of RCRA and analogous state authorities provide EPA and states with authority to address releases of hazardous wastes or hazardous constituents within the facility boundary. Corrective action project managers should work with permit writers as appropriate to incorporate IC requirements as specific permitting conditions. By doing so, such conditions would be enforceable through the permit.

Section 3004(v) allows EPA or states to compel corrective action beyond the facility boundary, provided that adjacent landowners give permission to the facility to conduct necessary corrective action activities. Where the use of an IC is contemplated for releases that have migrated off site from the facility, corrective action project managers should require the owner or operator to identify the owners of the off-site property and demonstrate that an enforceable IC is placed on that property as well.



## Planning and Integrating ICs During Remedy Selection

- ICs are subject to evaluation criteria similar to other components of the remedy
- ICs should be analyzed during the RFI or CMS
- ICs should not be considered an “add-on” or afterthought
- Authorized states typically have primary responsibility for ICs
- “Corrective Action Completion with Controls” means that cleanup expectations are met through both engineering controls and ICs

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### Notes:

- **ICs are considered corrective measures and should be subject to evaluation criteria similar to other components of the remedy:** ICs are considered as corrective measures under RCRA. ICs, either alone or as a component of a remedy, must be evaluated at the same level of detail as other remedy components.
- **Careful analysis of ICs during the RFI or CMS:** Scoping of investigations, deciding on screening levels, developing exposure assumptions, and establishing future land use assumptions may result in the need for ICs. As such, both regulators and stakeholders need to be involved. Important considerations include:
  - The potential use of ICs
  - The specific types of ICs that may be available
  - The potential impediments to successful implementation and long-term enforcement of ICs
  - The standard of care and degree of analysis in the RFI or CMS should be as high for ICs as for other elements of the remedy. The larger the role ICs will play in the remedy the more analysis and research on the reliability of such ICs should be completed. Careful study can help identify factors that affect the overall choice of the remedy and may identify innovative ways of using these legal devices to accomplish remedial objectives.
- **ICs should not be considered an automatic “add-on” or afterthought:** ICs should be seriously evaluated in comparing remedial alternatives before remedy selection. The potential use of ICs should be carefully considered and evaluated early during the design of the remedial alternative because of the potential impacts of the use of ICs on the remedial design. For example, whether a containment remedy will be considered adequately protective may depend in part on whether ICs to prevent access or interference with the containment system will be reliable and enforceable.



## Involvement of Stakeholders

- State and local “buy-in” to the selected remedy and associated ICs is critical to its success
- Consultation should occur as early as possible

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### Notes:

- **State and local “buy-in” to the selected remedy and associated ICs is critical to its success:** Corrective action project managers should consult with appropriate state and local governmental authorities, local community groups (particularly if such groups have environmental justice concerns), nearby property owners, developers, and land use planning groups to determine the potential impacts and effectiveness of proposed ICs. In situations where EPA or an authorized state will rely on state or local governments to enforce an IC, those parties must be consulted to allow project managers to understand how effective the proposed IC will be.
- **Consultation should occur as early as possible:** When ICs are identified as a component of a remedy, a variety of legal steps often must be taken to implement those ICs. Although these steps may vary from facility to facility; however, care should be taken in the design and implementation of the ICs at any facility. Project managers should consult with various stakeholders, including real estate experts and Regional and state counsel, regarding ICs as early as possible. Project managers should not postpone consultation with stakeholders once the remedy is selected; otherwise, long delays to the remedy implementation may occur.



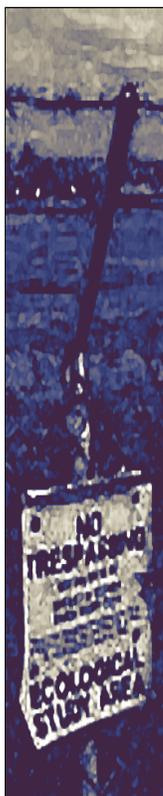
## ICs in the Decision Documents

- The remedy selection criteria should be applied to IC evaluation
- The remedy decision document should clearly state the purposes and performance goals of the ICs
- The decision document should fully evaluate the IC component of the remedy
- The decision document must indicate how the ICs will be implemented, monitored, and enforced

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### Notes:

- **The remedy selection criteria should be applied to IC evaluation EPA guidance** (*Institutional Controls, September 2000*) outlines seven (7) criteria used to evaluate potential remedies. These criteria apply to any ICs that may be incorporated as part of the remedial design. As outlined in EPA guidance, corrective action project managers need consider the following seven (7) criteria to evaluate ICs:
  - **Long-Term Effectiveness and Reliability:** A critical consideration involving ICs is how they maintain protectiveness of the remedy over time. If the monitoring or enforcement of a IC is an issue, the alternative may not be effective over the long-term. The project manager should evaluate an IC's adequacy, reliability, and likelihood of success over the long-term.
  - **Reduction of Toxicity, Mobility or Volume through Treatment:** ICs typically have no bearing on this criterion. A remedy that relies on ICs may have a disadvantage with respect to this criterion unless the remedy also requires treatment to achieve the reduction in toxicity, mobility or volume (for example, if the remedy also requires treatment of a contaminated environmental media to a specific concentration).
  - **Short-Term Effectiveness:** For example, ICs can be used to limit exposures to the community or on-site workers during the construction and operational phases of the remedy.
  - **Implementability:** For example, ICs that may be difficult to establish, monitor, and enforce based on considerations related to state and local laws, regulations, or ordinances are less likely to be easily implemented.
  - **Cost:** The costs for establishing, monitoring, and enforcing ICs for each alternative should be included in the overall cost analysis of each option.
  - **Local Government and Community Acceptance:** For example, restrictions on land or groundwater use are typically of interest to the affected community.
  - **State Acceptance:** The IC may rely on state governments for enforcement. State governments also can play a significant role in establishing necessary ICs. This is true especially for governmental ICs, or where the state may be a grantee for an easement or covenant and may not be willing to accept restricted future land use.
- **The remedial decision document should clearly state the purposes and performance goals of the ICs:** The decision document (corrective action order or permit) should specify performance standards for ICs. Sufficient analysis should be documented to support a conclusion that effective implementation of ICs can be reasonably expected. It is typically desirable to retain flexibility in the decision documents as to the precise type of ICs to be implemented (for example, specific property interest to be created by deed). Allowing flexibility allows for a change in the selection of the ICs without amending the decision document.
- **The decision document should fully evaluate the IC component of the remedy:** The decision document should specify whether ICs are needed to implement the engineering portion of the remedy or maintain its long-term effectiveness. The decision document also should specify the exposure and risk assessment assumptions which must be maintained in order for the IC to remain protective over time.
- **The decision document needs to indicate how the ICs will be implemented, monitored, and enforced or provide a commitment to develop a facility-wide IC implementation plan:** At active facilities there should be more certainty as to the tools to be used to implement ICs. At minimum, there should be a commitment in the decision document to establish a facility-wide IC implementation plan as a deliverable.



## ICs in the Decision Documents (Cont.)

- IC “layering”
- Using ICs in series
- Contingency planning in the decision document
- Making all stakeholders aware of the existence and impact of ICs at a facility
- When to reopen or modify the decision document

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### Notes:

- **IC “layering”:** To enhance the overall effectiveness of ICs, corrective action project managers should consider “layering” ICs (that is, using multiple ICs at the same time, such as zoning and easements). For example, EPA has specifically cautioned against the automatically restricting future land use assumptions by extrapolation of current land use or relying solely on designated zoning or industrial use codes (see 55 FR, 19452, May 1, 1996 Federal Register). In such situations (for example, where zoning already restricts land use) the use of additional “layers” of ICs may be appropriate.  
  
Layering can also increase the number of parties involved in the monitoring and enforcement of the ICs that are used and therefore strengthen the network that maintains the remedy and protects human health and the environment over time. In other words, each party may play a role in maintaining the remedy.
- **Using ICs in series:** ICs may be applied in series to help ensure both the short- and long-term effectiveness of the remedy. For example, a corrective action project manager may use an enforcement IC to require the land owner to obtain an easement from an adjacent property owner in order to conduct groundwater sampling or to implement an engineering portion of the remedy. This easement then may not be needed for the long-term effectiveness of the remedy and can be terminated when construction of the remedy is complete.
- **Making all stakeholders aware of the existence and impact of ICs at a facility :** The authorized agency can provide notice to appropriate state and local governmental agencies and other interested groups that ICs exist at a site, and that it is essential to maintain those controls and ensure that users of the property abide by them. The more people who are responsible for or aware of an IC, the easier it is to ensure maintenance of the remedy.
- **Reopening or modifying the decision document:** When failure to establish, maintain, and enforce ICs calls the long-term protectiveness of a remedy into question, it may be appropriate to reconsider elements of the remedy. For example, if the remedy had been selected assuming an industrial land-use scenario and it included property restrictions that prevented residential development, a property owner’s subsequent refusal to comply with these restrictions would jeopardize the long-term effectiveness of the remedy. In such a case, it might be necessary to reconsider the clean-up levels established in the decision document to make them appropriate for a residential land-use scenario. An amendment to the decision document might be required in these situations depending on the significance of the change in the remedy.
- **Contingency planning:** Contingency planning calls for building “triggers” into the remedy that indicate when the remedy has failed or is likely to fail due to changes in the nature of the contaminant, contaminant-plume, or site use. These triggers are performance indicators of what constitutes failure of success of the IC (e.g., zoning will be successful if land is used only for the purpose for which it is zoned). Using a contingency remedy in the decision document may be an effective way to modify the remedy or impose more stringent requirements to compel the establishment, maintenance, and enforcement of the necessary ICs. For example, it might be appropriate to use a contingency remedy that requires cleanup to lower concentrations if ICs are not fully established and maintained as specified in the original remedy. Other examples of contingency remedies include situations in which a contaminated groundwater plume is moving in the direction of a housing development. The remedy for the site includes monthly monitoring of groundwater wells combined with an IC that restricts well drilling within the area. If the post-remedy documentation includes an expected range for monitoring results, any results outside of that range may indicate that the IC is no longer effective, and may specify a different, more aggressive IC.



## Monitoring ICs

- During remedy construction and operation
- Periodic inspections
- At RCRA sites with a permit or order in place
  - Monitoring and reporting requirements should be specified in a separate document or in the permit and/or order itself

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### Notes:

- **During remedy construction and operation:** ICs are sometimes needed over a short period of time during construction or operation of the remedy to ensure that potentially harmful exposures to human health or the environment are controlled until performance standards specified in the remedy are achieved. For example, a local ordinance restricting groundwater use may be needed only until the pump and treat remedy meets its intended objectives, or excavation controls to protect workers from exposure to contaminated shallow groundwater may be needed until the remedy meets the remedial objectives outlined in the Statement of Basis.
- **Periodic inspections:** Depending on the scope and nature of the remedy and the IC's role in the remedy, inspections should be conducted at an appropriate frequency (for example, annually or quarterly) to ensure no inappropriate activities (for example, prohibited land or resource uses) are being conducted on or adjacent to the contaminated site. Formal enforcement or other appropriate action should be taken if a violation of the terms of an IC(s) are discovered.

Inspections of the affected property may be required as part of the operation and maintenance of the remedy. Even though these inspections often are not performed specifically for the purpose of monitoring an IC, they may provide an opportunity to assess activities at the site relevant to the IC. For example, a required inspection of monitoring wells may also provide an opportunity to determine compliance with an IC restricting soil excavation. Other existing inspection routines associated with regulatory programs not related to the remediation of the site may also provide an opportunity to ensure the protectiveness of an IC at the site in question.
- **At RCRA sites with a permit or order in place:** Where existing orders or permits are in place, IC requirements may be established and documented in a separate document; or by modifying the existing permit and/or order.



## Enforcing ICs

- Enforcement authorities: Orders under RCRA may require additional restrictions
- Section 3008(a) of RCRA
- Enforcement policies for ICs vary within EPA Regions and authorized states
- Authorized states will typically be the implementing, enforcing, and overseeing agency.

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### Notes:

- **Enforcement authorities: Orders under RCRA may require additional restrictions:** RCRA Sections 3008(h) and 7003 specify EPA's enforcement authorities under the corrective action program; authorized states will have their own authorities. Although these authorities are sometimes used to enforce ICs, project managers should be aware they are most effective against current owners, as they do not bind subsequent owners. When ownership of a property subject to corrective action is transferred, the United States (and any other party who obtains an enforceable property interest) may seek to enforce the terms of an IC established through land transfer documents.
- **Section 3008(a) of RCRA may be used:** Like any other violation of RCRA requirements, EPA and authorized states may use the authority under Section 3008(a) of RCRA (or analogous state authorities) to issue administrative orders to compel facility owners or operators to return to compliance with violations of requirements related to ICs, including stipulated penalties for continued noncompliance.
- **Enforcement policies for ICs vary within EPA Regions and authorized states:** Some EPA Regions and states have adopted policies related to the enforcement of ICs. For example, EPA Region 5 policy states that a remedy that relies on ICs should be selected only when the facility owner or operator has agreed to a written enforceable order that contains specific requirements for an IC. This policy further states that Region 5 will generally ensure the enforceability of the owner or operator's commitment to maintain and operate the selected IC through the use of consent orders or judicial consent decrees. Finally, Region 5's policy states that facilities with permits or a approved closure/post-closure care plans will be required to enter into a consent order independent of the permit or closure/post-closure care plan to enforce IC requirements.



## Failures of IC

- Actions prohibited by ICs may occur
- Remedy must be designed to identify potential failures of ICs
- Need for monitoring and enforcement

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### Notes:

- **Actions prohibited by ICs may occur:** Particularly in the case where ownership of a property has been transferred, subsequent property owners may not abide to the terms of ICs. For example, although the property owner may abide by the terms of an IC, a subsequent property owner may not (for example, the subsequent property owner may engage in activities such as residential development that are prohibited by zoning or other land-use restrictions).
- **Remedy must be designed to identify potential failures of ICs:** Remedies that involve ICs should include provisions to the extent allowable under state and local law to notify EPA or an authorized state of situations that may compromise the goals of the ICs. For example, project or facility managers may wish to require remedies that involve ICs to include a provision for advance notice to EPA or an authorized state of proposed property transfers and to demonstrate adequate financial assurance for maintaining the ICs. Similarly, project managers may wish to require periodic inspections of the ICs and subsequent reports or certifications that the IC is being maintained as required, and specify the federal, state, or local governmental agencies to which such information should be submitted.
- **Need for monitoring and enforcement:** Because of the potential for failures of ICs, adequate monitoring and enforcement are crucial to the success of remedies that require ICs. Although allowable mechanisms may vary based on state and local law, options that may be considered by the project manager include a requirement to provide access to EPA or state environmental agencies to inspect and verify that the facility owner or operator is complying with the terms of the IC. In addition, each IC typically will have specific legal requirements. The project manager should consult with appropriate Regional or state counsel to ensure that ICs are legally enforceable.



## Emerging Issues

- Guidance on estimating the life cycle costs of ICs
- Imprecise language used to discuss ICs
- Information infrastructure, management, and dissemination for tracking ICs
- Lack of uniformity in applicable state laws

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### Notes:

- **Guidance on estimating the life cycle costs of ICs:** EPA is currently developing guidance on estimating costs of implementing ICs. Under examination are (1) the type of costs that should be included, such as property devaluation and other hidden costs; and (2) the methodology and procedures to estimate life cycle costs, including the discount rate and time period for which costs should be estimated.
- **Imprecise language used to discuss ICs:** Language describing ICs in decision documents often requires more precision. For example, reference to a “deed restriction” could mean a deed notice or an easement. Where IC language is not explicit, the public may not understand the real effect of the IC and the impact on adjacent properties. Language for ICs should identify well defined objectives.
- **Information infrastructure, management, and dissemination for tracking ICs:** EPA has begun to research improvements to information infrastructure, management, and tracking the use of ICs at facilities subject to corrective action.
- **Lack of uniformity in applicable state laws:** There is a great deal of variability regarding the type of ICs available and the ability to enforce ICs within states and local jurisdictions. For example, certain states have enacted statutes that provide the state with legal authority to restrict land use at contaminated properties. In addition, several states like the State of Colorado, for instance, have adopted statutes that specifically provide for conservation easements, while other states have indicated that they are not interested in such requirements. In addition, some states are responsible for issuing advisories or warnings of potential risks and providing registries of hazardous waste sites, while others states are not.



## Emerging Issues (continued)

- Planning documents for ICs
- Guidance on community involvement for ICs
- Guidance on implementation planning for ICs and enforcement

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### Notes:

- **Planning documents for ICs:** Many of the problems regarding using and implementing ICs as part of remedies may be eliminated with better planning. Information regarding means to establish, pay for, monitor and enforce ICs should be thoroughly discussed in the CMS or in a subsequent design document, such as those prepared in support of a CMI design (for example, an “IC implementation plan” prepared after the selection of the final remedy for the facility.
- **Guidance on community involvement for ICs:** EPA is currently developing guidance that is designed to assist members of local communities to become involved in the process for evaluating and using ICs as part of the cleanup of sites in their communities.
- **Guidance on implementation planning for ICs and enforcement:** EPA is currently developing guidance that is expected to address the role of ICs as part of the selection of final remedies at corrective action facilities.



## IC Advantages

- May allow lower costs to achieve protectiveness in a remedy
- Addresses exposure issues related to long-term occupation of site after remedy is completed
- Supplements and protects engineered controls

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### Notes:

- **May allow lower costs to achieve protectiveness in a remedy** : At some industrial corrective action sites, EPA or an authorized state may be able to use a combination of clean-up to industrial standards and an IC that restricts exposure to reduce the cost of the final remedy (for example, such a remedy may require less contaminated soil to be excavated for treatment).
- **Addresses exposure issues related to long-term occupation of site after remedy is completed:** ICs help to provide an early warning system to prevent unacceptable exposures.
- **Supplements and protects engineered controls** : The use of ICs will help ensure that engineered components of a remedy are not adversely affected by activities at the site. For example, a prohibition on excavation at a site where a cap has been installed will help to prevent degradation of the cap.



## IC Disadvantages

- May rely on cross-jurisdictional support
- May increase long-term maintenance costs
- Introduces uncertainty with regard to effects of remedy failure

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### Notes:

- **May rely on cross-jurisdictional support:** The use of ICs may require EPA and state environmental agencies to rely on other federal, state, or local agencies to monitor or enforce the requirements of ICs. In many cases, EPA or a state may not have direct authority over the operations of these agencies.
- **May increase long-term maintenance costs:** Long-term maintenance costs may be more for remedies involving ICs than for those remedies that do not involve ICs. For example, a corrective measure that requires clean-up to residential standards may have minimal maintenance costs, while a remedy that requires clean-up to industrial standards coupled with an IC may result in significant costs to monitor and enforce the IC.
- **Introduces uncertainty with regard to effects of remedy failure:** When an engineering remedy fails, the effects of such a failure are often obvious. For example, when a cap fails, there may be visual evidence of subsidence or erosion, and associated evidence of exposure of buried wastes. When an IC fails, however, it often is difficult to determine the impact or measure the increased risk to human health and the environment.



## In Review

- ICs are non-engineering response measures
- Project managers should identify key issues that may affect the ability to establish, monitor, or enforce ICs
- ICs must be evaluated on whether they are protective of human health and the environment over time.
- Project managers need to coordinate with all potential stakeholders

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### Notes:

- **ICs are non-engineering response measures:** ICs refer to non-engineering measures intended to prevent or reduce exposure to hazardous wastes or hazardous constituents. In general, there are four (4) types of ICs: informational, governmental, proprietary, and enforcement and permit tools with IC components.
- **Project managers should identify key issues that may affect the ability to establish, monitor, or enforce ICs**
  - The project manager's role with respect to ICs can vary. Potential roles include:
    - During corrective action planning activities, the project manager can identify key issues such as screening levels, exposure assumptions, possible stakeholders or intended future use of the site that may affect the ability to establish, monitor, or enforce ICs.
    - The project manager may need to coordinate with personnel from other federal, state, or local agencies to ensure that proposed ICs will be readily implementable.
- **ICs must be evaluated on whether they are protective of human health and the environment over time:** As part of any decision, ICs must undergo an evaluation of whether they are protective of human health and the environment over time. Careful analyses of ICs should occur during the RFI or CMS. Important considerations include:
  - The potential for use of ICs
  - The types of ICs that are available
  - Potential impediments to use of ICs (for example, inability to ensure effective monitoring and enforcement)
  - Estimated costs to implement ICs
  - Monitoring and enforcement considerations